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RHYTHMIC BREATHING
PLUS
OLFACTORY NERVE INFLUENCE
ON RESPIRATION

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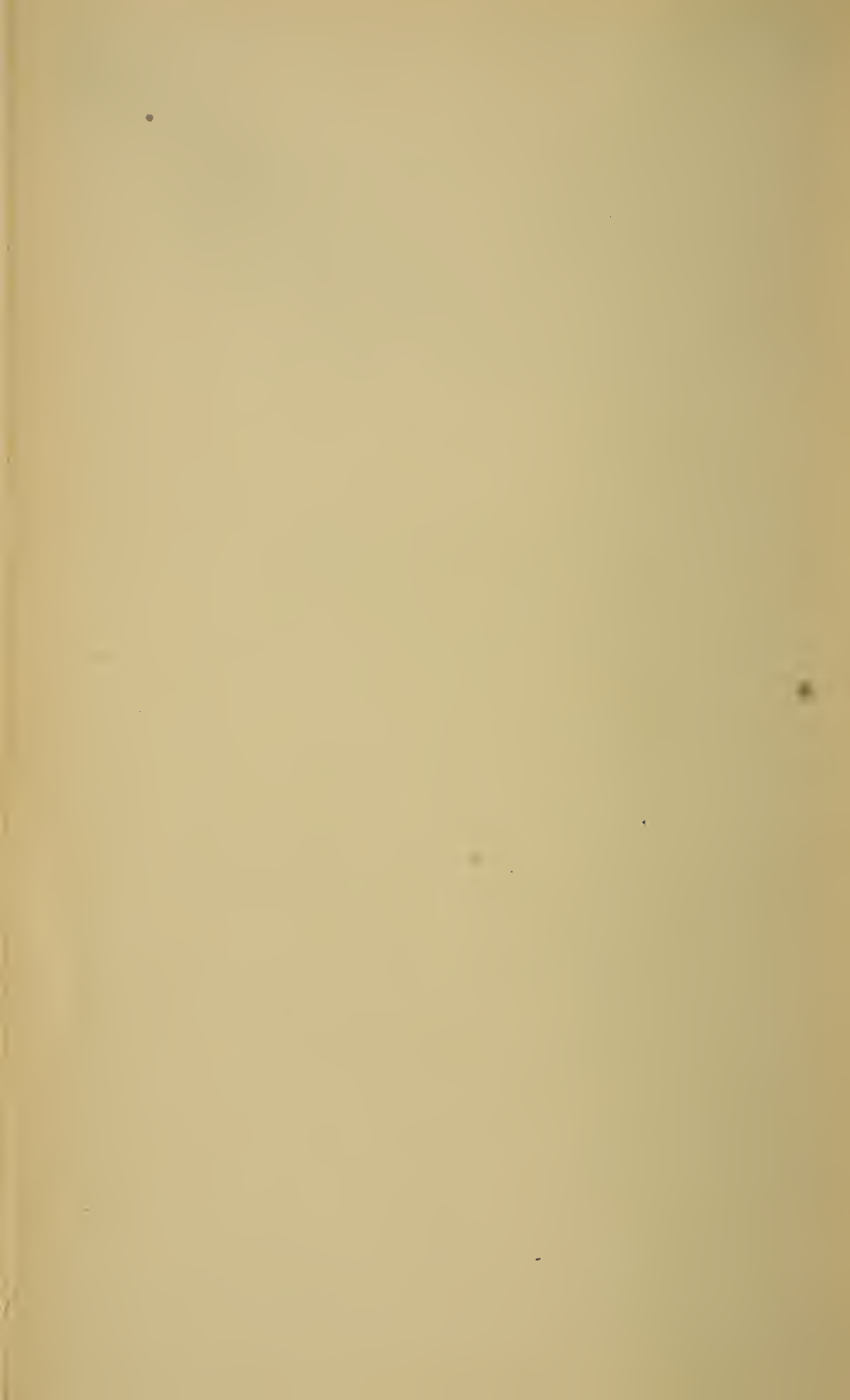
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William Benham Snow

Rhythmic Breathing

plus

Olfactory Nerve Influence
on Respiration

By author of

*"A Method for the Millions," "The Key to
Physical Regeneration," "The House we
Live in," "Nasal Hygiene," "Conscious
Relaxation an Effectual Substitute for
Hypnosis in Psycho-Therapy"*

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INTO SCANDINAVIAN, AND OTHER FOREIGN LANGUAGES

Dedicated to
DEFECTIVE BREATHERS



PUBLISHER'S NOTE

THIS illustrated lesson-book on Rhythmic Breathing plus Olfactory Nerve Influence on Respiration, will be found to be of equal value to the child or the adult. It is offered to the public in the interests of an organization, for better lung development in children, —a crusade organized and chartered in 1906, now internationally recognized as one of the most important educational movements of the twentieth century, one that will leave its imprint on coming generations.

RICHARD B. NOBLE.

PUBLISHER, HUNTINGTON CHAMBERS,
BOSTON, MASS.

OBJECT OF THE CRUSADE

To establish centers in all large cities, where *parents* and *teachers* may obtain free scientific instruction and practical suggestions for the prevention of nasal and pulmonary troubles in children.

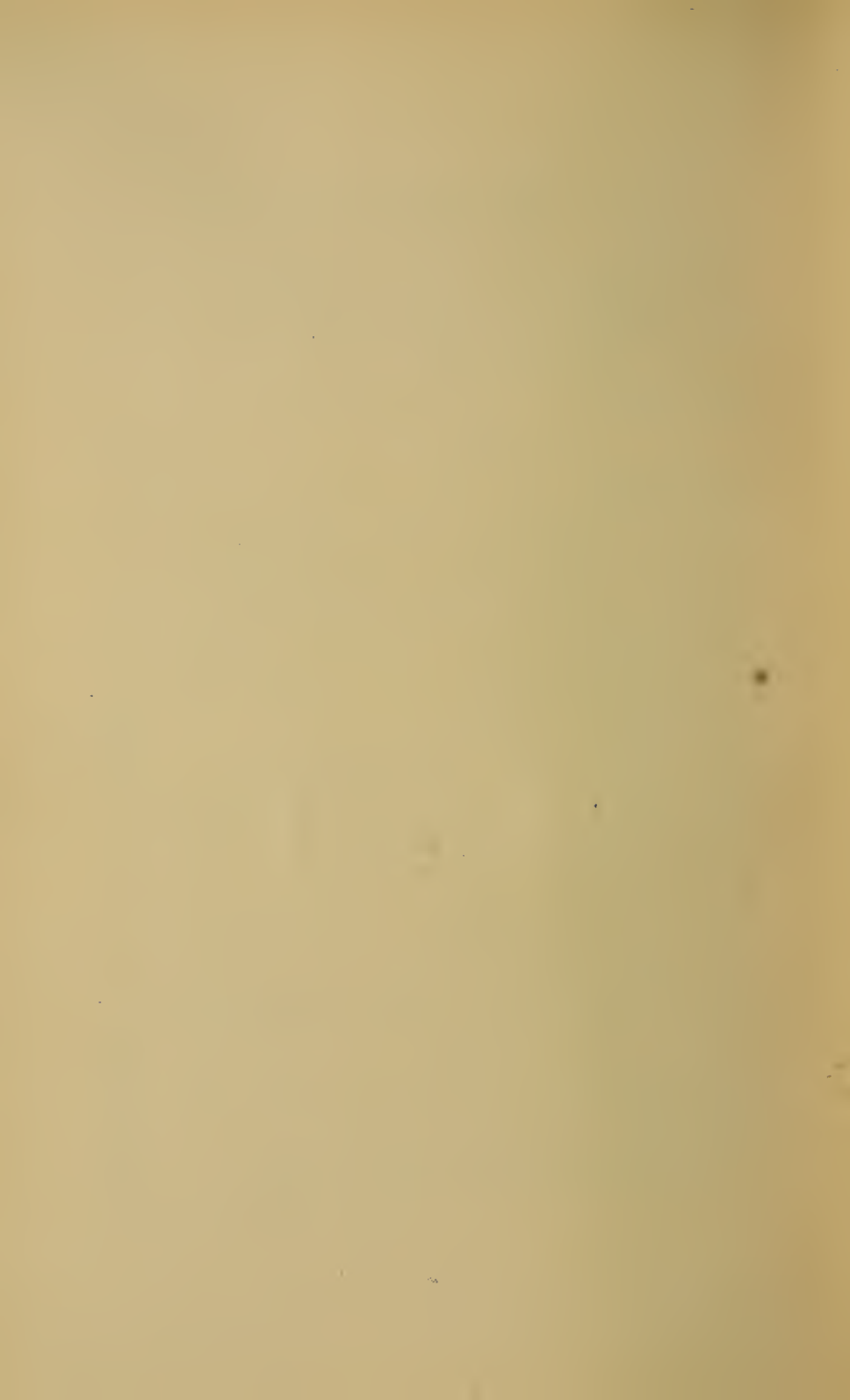
During a recent visit to Washington, D. C., to lecture (by the invitation of the Board of Education of the District of Columbia, Washington, D. C.) the founder personally invited the fullest investigation of this Crusade, of the Surgeons-General of the Army, Navy and Marine Hospital Service. And the Board of Directors of this Crusade and organization, cordially invite the investigation and co-operation of all State and Municipal Boards of Health and Education.

Much of the work of this Crusade is free.

During the past two years, more than ten thousand mothers and teachers and children have been instructed. All are urged to join an *endless chain of Crusaders*, and unite in gaining knowledge that will stamp out the greatest menace to the lives of children the world has ever known.

CONTENTS

LESSON	PAGE
1. THE CHEMISTRY OF BREATH	1
2. OLFATORY NERVE INFLUENCE ON RESPIRATION	3
3. BETTER LUNG DEVELOPMENT FOR CHILDREN	12
4. FIRST AID FOR PREVENTION OF CATARRH AND PULMONARY AFFECTIONS (from author's address before American In- ternational Congress, 1906)	20
5. THE CELLULAR PROCESS OF BODY BUILDING	28
6. "SIMPLIFIED" DIETETICS	37
7. OBESITY, CAUSE AND PREVENTION	52
8. "SIMPLIFIED" VOICE BUILDING (VOICE PICTURES)	62
9. ORIGIN OF MUSIC (EAST INDIAN TRADITION)	81
10. CONTROLLED BREATHING—THE BASIC PRINCIPLE OF MUSCU- LAR ENERGY	88
11. RHYTHM AND CONTOUR CULTURE	99
12. FIRST AID TO LONGEVITY	109
INTRODUCTION TO EXERCISES	121



ILLUSTRATIONS

	PAGE
Olfactory Bulb with Its Nerves. (Dalton)	<i>Facing</i> 4
Diagram of Cells and Fibers in Olfac- tory Region	" 5
Nerves of the Outer Wall of the Nasal Fossæ	" 6
Olfactory Nerves (Herschfeld and Leveillé)	" 6
An Oriental Baby (High Caste)	" 12
An English Child	" 13
An American Child	" 14
Public School Girl (Mouth Breather)	" 15
Public School Boy (Mouth Breather)	" 15
Test Cases (Common Types in Public Schools) :	
Shallow Breather (Starving for Oxygen)	" 16
Same Girl, Two Weeks Later	" 16
Mouth Breather (Boy)	" 17
Same Boy Two Weeks Later	" 17
Shallow Breather (Starving for Oxygen)	" 18
Same Boy After Three Weeks' Training	" 18
A Defective Breather (Before)	" 19
Same Girl After Two Weeks' Training	" 19
Metric Table and Harmonic Scale	" 76
Metric Table and Harmonic Scale (Bleyer and M. M. Wilson)	" 76

	PAGE
Voice Figures (Bleyer)	<i>Facing</i> 76
Voice Pictures (Mrs. Hughes) (by permission)	“ 77
Voice Figures (Chladni)	“ 77
The Vina of India	“ 80
Exercise for Developing Lung Power	“ 88
Exercise for Strengthening Chest and Ribs	“ 89
Rhythmic Development of Muscles	“ 93
Modern Contours	“ 101
Homer	“ 120
How to Energize Circulation and Flatten Shoulder Blades	“ 121
How to Re-establish Rhythmic Breath	“ 126
How to Energize Muscles and Arouse Nerve Energy by Stretching Exercises in Bed	“ 126
Right Way to Stand and Walk	“ 127
Energizing Whole Body Through Breath Control	“ 127
Skeleton of Ribs, Showing Attachments of Cartilage	“ 128
Exercise for Reducing Hips and Waist	“ 129
Exercise for Reducing Generally	“ 129

LESSON 1

THE CHEMISTRY OF BREATH IN ITS RELATION TO PHYSICAL EFFICIENCY

. . . "And a small drop of ink,
Falling like dew upon a thought, produces
That which makes thousands, perhaps millions, think."
—*From mural inscriptions, Congressional Library,*
Washington, D. C.

"I am in health. I breathe."—*Shakespeare.*

THE Alpha and Omega (the beginning and the end) of life remain obscured in the mists of past centuries.

Up to date the most practical solution of life's eternal mystery, is, that to remain alive, even for a few minutes, we must breathe. The cessation of breathing, constitutes the dissolution of all bodily functions, in what is called death.

Modern scientific research proves that every material connected with life is a chemical substance, and that physical life abounds in chemicals, which are apparently inert until brought into electro-chemic activity by the absorption of oxygen, through the nat-

ural and automatic function of rhythmic breathing.

Chemical structures find their way into the blood through the route of digestion and assimilation of food stuffs, but are not ready for absorption into the chemical process of body building, until their potential energy has been liberated by oxygen. We live in an electrical era, and it is not too much to assume that the highest electrical vibration in this sphere is human life.

Back of it all is the one eternal first cause known as universal energy, creating by its different rates of vibration all the physical phenomena of which man is conscious.

In the Western Hemisphere rhythmic breathing plus olfactory nerve influence on respiration (as designed by nature) is comparatively a lost art.

"The foundation of every state is the education of its youth."—*Dionysius*.

It is in the interests of millions of defective breathing children in homes and public schools, that this lesson-book is offered to parents and teachers.

LESSON 2

OLFACTORY NERVE INFLUENCE ON RESPIRATION

“There is only one good, namely knowledge. And only one evil, namely ignorance.”—*Socrates*, Diogenes Laertius, Sec. XIV.

As the chief sentinel of the respiratory tract, the nose has a function second to none in physiological value. The muscles of respiration begin in the nostrils with two tiny sets called dilators and constrictors (their Latin names are devoid of meaning for the average reader. This book is intended for practical use among the laity).

It is just inside the lower edges of the nostrils that the process of filtering the air we breathe begins, for which purpose we find a growth of short hairs called vibrissæ.

Another function of the nose is to moisten and raise the temperature of the air on its route to the lungs. Its mucous secretions (in normal health) have probably a sterilizing or germicidal action on the air inhaled. Another function of the nose controls the

resonators, or sound cavities, of the voice, which are closely connected with the nasal passages.

Jean de Reszke, one of the most prominent authorities of the age on voice building and tone placing, is reported to have said: "La grande question du chant devient une question du nez" (the great question of singing becomes a question of the nose).

In the olfactory region of the nasal fossæ can be found the olfactory bulb. See cut (Dalton).

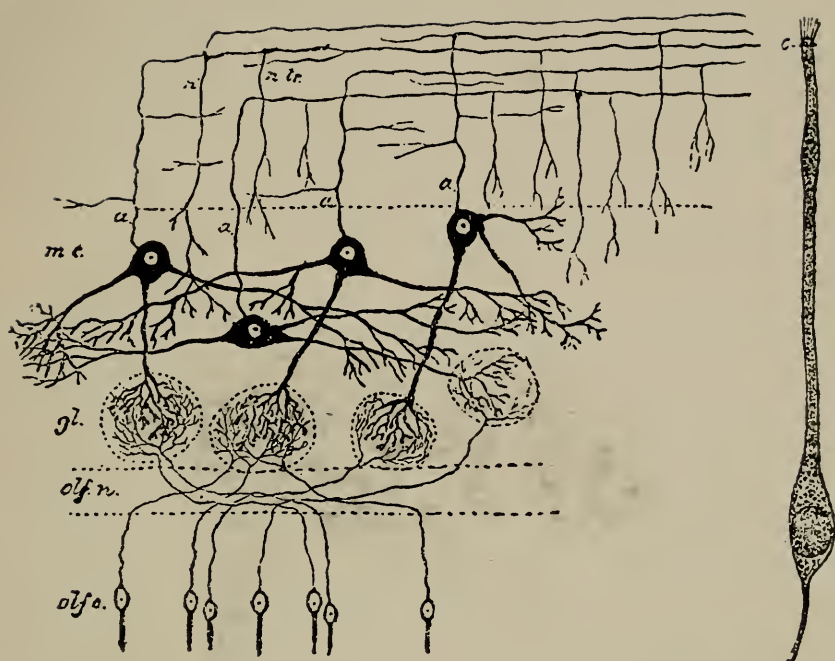
Some of the terminals of the olfactory nerve bulb—the rod, or olfactory nerve cells—were discovered by Schultze, and a distribution of glands, by Bowman (see cut). Some of which glands and nerves are not entirely confined to the olfactory mucous membrane; they are now believed to extend beyond it and into the respiratory parts of the fossæ. (For further and more scientific elucidation the scientific student is referred to Laurens' "Surgery on Nose, Throat and Ear," or any good work on the anatomy of the nasal cavities.)

The author is trying to simplify this chapter for the laity. Many practical experi-



- 1, OLFACTORY BULB WITH ITS NERVES
- 2, NASAL BRANCH OF THE FIFTH PAIR OF CRANIAL NERVES
- 3, SPHENO-PALATINE GANGLION

(Dalton's distribution of nerves in nasal passages)



c. AN OLFACTORY CELL. HUMAN. (v. Brunn)

DIAGRAM OF THE CONNECTIONS OF CELLS AND FIBERS IN THE
OLFACTORY BULB

olf. c., cells of the olfactory mucous membrane; *olf. n.*, deepest layer of the bulb composed of the olfactory nerve-fibers, which are prolonged from the olfactory cells; *gl.*, olfactory glomeruli, containing arborizations of the olfactory nerve-fibers and of the dendrons of the mitral cells; *m.c.*, mitral cells, *a.*, their axis-cylinder processes passing toward the nerve-fiber layer, *n.tr.*, of the bulb to become continuous with fibers of the olfactory tract; these axis-cylinder processes are seen to give off collaterals, some of which pass again into the deeper layers of the bulb; *n.*, a nerve-fiber from the olfactory tract ramifying in the gray matter of the bulb.



ments and tests along the lines of olfactory nerve influence in controlling respiration and in which there have been no failures have been made during the last three years on all sorts and conditions of patients.

No claim is made for a new and startling discovery.

No enthusiastic theory is advanced that people must swallow "*cum grano salis*."

Merely a simple and practical adaptation of a method that has been common in the Orient for the past four thousand years of daily utilizing olfactory nerve influence in the control of respiration.

Fullest investigation (by those qualified to judge) is invited, and a crowd of living witnesses, of all ages from five to seventy-five, can demonstrate the efficacy of this method in preventing and curing catarrhal and other respiratory troubles of the nose, throat and bronchi, and rendering them comparatively free from colds, etc.

"He who *tastes* a single grain of mustard seed, knows more of its flavor than he who *sees* an elephant load of it."
—*Old Sanscrit Proverb*.

6. All muscles controlling the respiratory tract were designed for use. Muscular ac-

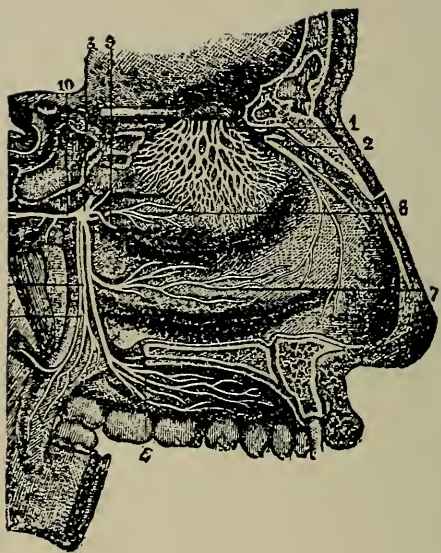
tivity can only find volition through expenditure of nervous energy from some nerve center. *The olfactory bulb is an important nerve center.*

Some, perhaps, who read this will impatiently set aside these views as visionary or not in accordance with the anatomical history of the Western world.

It seems to be what Mark Twain has called the cussedness of "human nature" to raise up barriers against progressive innovations and condemn them without investigation.

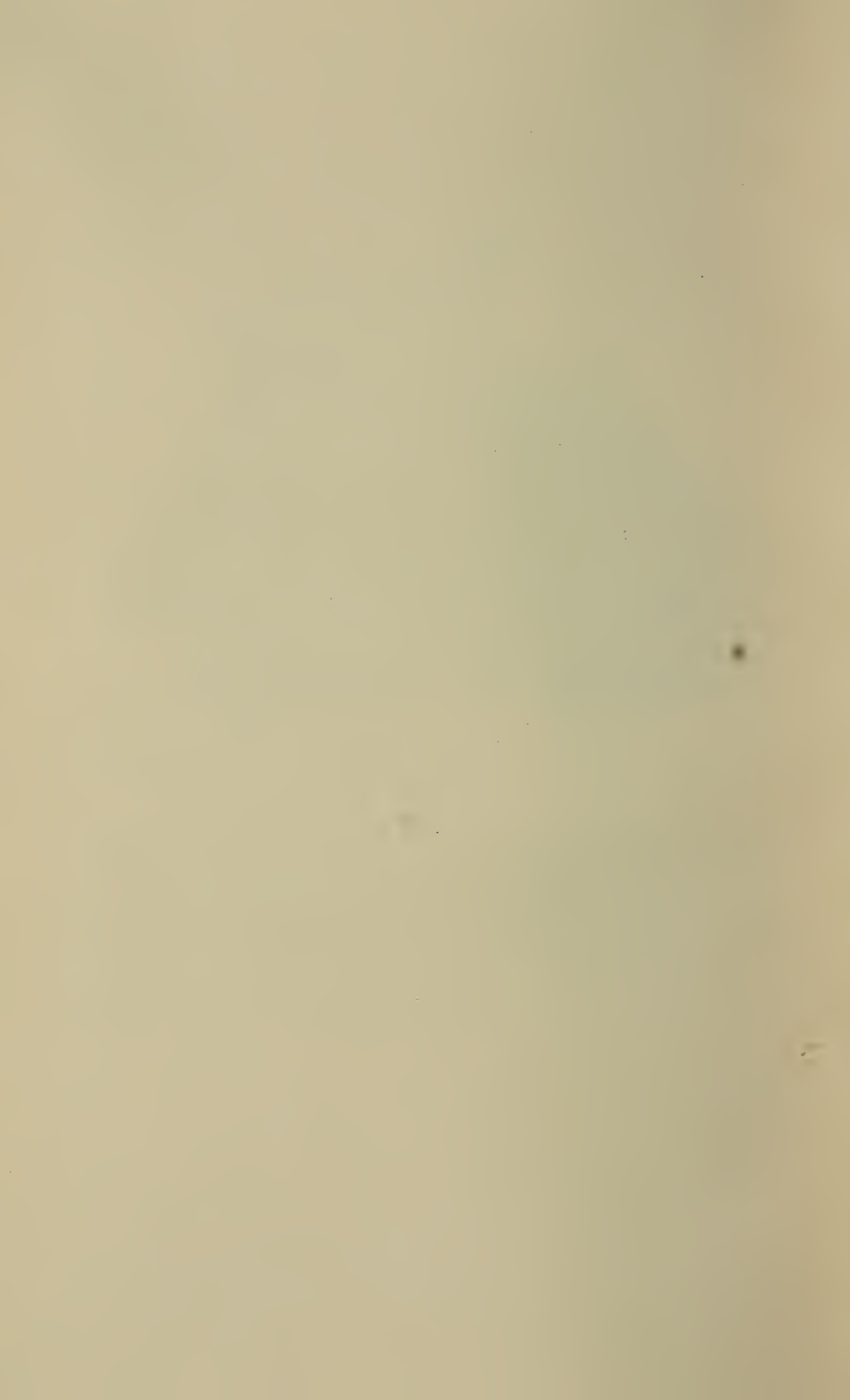
"The friction which prejudice causes can only be overcome by the spread of knowledge."

It is well to profit by the mistakes of those who have passed on. In the English medical records one may still read that when Sir James Simpson introduced chloroform as an inhalent in surgery he was bitterly opposed by the medical faculty, who said, "We violate the boundaries of our noble profession when we urge or seduce our fellowmen, for the sake of avoiding pain, to pass into a state of existence the secrets of which we know so little." Even his church decided he was committing wilful sin and turned him out.



NERVES OF THE OUTER WALL OF THE NASAL FOSSÆ. (From Sappey, after Hirschfeld and Leveillé) $\frac{3}{5}$

1, network of the branches of the olfactory nerve, descending upon the region of the superior and middle turbinated bones; 2, external twig of the nasal nerve; 3, sphenopalatine ganglion; 4, ramification of the large palatine nerve; 5, small, and 6, external turbinated bones; 7, branch to the region of the inferior turbinated bone; 8, branch to the region of the superior and middle turbinated bones; 9, nasopalatine branch to the septum cut short.



To-day—*only fifty years later*—Dr. Osler writes, “Search the scriptures of human achievement and you cannot parallel in beneficence Anesthesia, Sanitation, with all that it includes, and Asepsis—a short half century’s contribution toward the practical solution of the problems of human suffering, before regarded as eternal and insoluble.”

Although the inventions and discoveries of modern date are stupendous in their magnitude and profound in their depth, too little is yet known of the laws which *govern the finer forces* of Nature.

There is no limit to human possibilities, but even for the most vital among us the span of life is very short, and we should welcome any rational method for the alleviation of pain and the possibility of prolonging the days of human existence.

If the seeds that have been sown by this Crusade (in the interests of which this book is offered to the public) take root, *correct respiration and nasal hygiene will become a national habit in the near future.*

It was Priestley who discovered that atmospheric oxygen possessed the property of converting venous into arterial blood. La-

voisier was the next on record to amplify the discovery, and he founded the *chemical theory of respiration*. Later, 1788, Goodwyn discovered and proved that when air was excluded from venous blood it remained unchanged and death followed. Of later date still, among the most reliable and scientific writers and contributors on the subject of respiration can be found the illustrious names of Bichot, Spallanzani, W. F. Edwards (whose work, "Influence des agents physiques sur la vie," remains a monument to scientific investigation and research). The distinguished chemist Dumas has calculated that the oxygen consumed by all animal life on the surface of our globe during one hundred years would not amount to more than $\frac{1}{3,000}$ of the quantity in our atmosphere.

The human lungs have been described as an aggregation of bronchial tubelets and air-sacs. The air cells of the lungs are very minute, and yet between every one of them run the capillary blood vessels. It is here that the interchange of gases takes place through the delicate walls of the air-sacs and capillaries, the blood giving up its carbonic acid gas in exchange for oxygen.

The lungs have a plentiful supply of *nerves*, originating in both the cranial and sympathetic systems. *Some of these nerves control respiration*, which in the human being has a double function—the interchange of gases between the blood and the atmosphere, and also, *when respiration is normal*, the rhythmic vibration of all the organs of the body.

It is respectfully suggested that the reader now lay down this book and prove for himself or herself the meaning of the writer and the simplicity of the method. It will take *about two weeks' time* to break the old habit of shallow breathing. *The simplicity of the method can be proved in two minutes!*

Normal breathing involves the function of smelling.

Stand by an open window, if convenient, and in imagination smell a favorite flower or fruit, or choice brand of cigar, *on a long, gentle inhalation*, and it will be found that the whole respiratory tract will respond without muscular effort. This merely proves that physical rhythm without muscular effort is possible. The method is not complete, however, without some special training for

the nostrils and nasal cavities. (See lessons at end of book.)

Particular attention is called to photographs of children illustrating the next lesson, whose defective breathing was entirely overcome by two weeks' tuition, and whose blood test proved a marvelous change in quality and activity. We note that after a short tuition in this method the chest has a natural tendency to remain high and expanded. All chest diameters expand with normal rhythm, and *the lungs automatically change their residual air without conscious muscular effort.*

The olfactory nerve bulb was undoubtedly designed and placed by nature in close connection with the nasal cavities, that it may take an active part in the function of respiration as well as that of sensing odors. It is more than probable that out of the great atmospheric ocean, oxygen conveys to our blood finer forces than its name implies. Chemistry has not yet clearly defined oxygen, but we have proof that every known substance on earth can be found in a rarefied form in the atmosphere.

The chemistry and physiological action of

many functions of the different nerve centers is still somewhat obscure, but the action of the olfactory nerve influence in controlling and aiding the respiratory muscles cannot be disproved, although very few physiologists of the Western Hemisphere are familiar with the nervous mechanism that controls respiration.

The special office of respiration is oxygenization of the blood. The presence of oxygen in the human system is necessary to life. Its vital activity is both creative and destructive. Through the rhythmic process of inhalation and exhalation, oxygen is constantly drawn into the system with every breath and as constantly exhaled (after its mysterious electro-chemic interchange of gases in Nature's laboratory) as carbonic acid gas.

If through *defective* or *shallow breathing* the blood does not get a normal supply of oxygen, the process of cellular tissue building is impaired or broken down, and there is a general depression of all bodily functions.

LESSON 3

BETTER LUNG DEVELOPMENT FOR
CHILDREN

PLUS

OLFACTORY NERVE INFLUENCE
ON RESPIRATION

IN talking to parents and teachers we base our statements on incontrovertible facts.

First, we must recognize that we and our bodies are separate entities, hence the body can only express itself as far as we control its functions.

Second, that breath is life, inasmuch as it controls the double function of the blood stream and the chemical affinity of the three natural sources of life, i.e., air, food and water.

Third, that a fertile source of nasal and throat trouble among children originates in a lack of physical resistance, caused by insufficient lung development.

The *prevention* of nasal and pulmonary tendencies rests largely in the hands of *mothers and school teachers*, who, in the cul-



A HINDU BABY (HIGH CASTE)





A RHYTHMIC BREATHER OF THREE YEARS

tivation of better lung power and resistance to disease in the little ones, hold the solution to the *greatest problem the modern world has to face*.

Let us consider the key to daily physical regeneration, and plan that more should be done for the daily care of the health of the children in the homes and the kindergartens. Take first the key to life itself—the function of breathing.

Rhythmic breathing controls not only the lung power and the double function of the blood stream, but every organ and nerve center in the body, including the brains.

The nostrils and the mouth are the direct gateways toward the lungs. The mouth is the portal common to the chest and the abdomen, too often, alas, left ajar, but the nostrils were designed by Nature to have special route to the lungs. It is always possible through fear or ignorance to attach too much importance to the germ theory of infection and too little significance to *resistance to disease*, which in normal health can easily be made a *daily habit*. It is only in cases of run-down, debilitated nerve force or impaired

nutrition of the body that infection from any source is possible.

Breath belongs to the involuntary functions of the body, and a natural rhythm of breathing which vibrates the whole body is the birthright of every child of high or low degree, but we of the Occident have lost this rhythm, and although all children are born with it, it is lost at a very early age through imitation, habit, nasal troubles and mouth breathing.

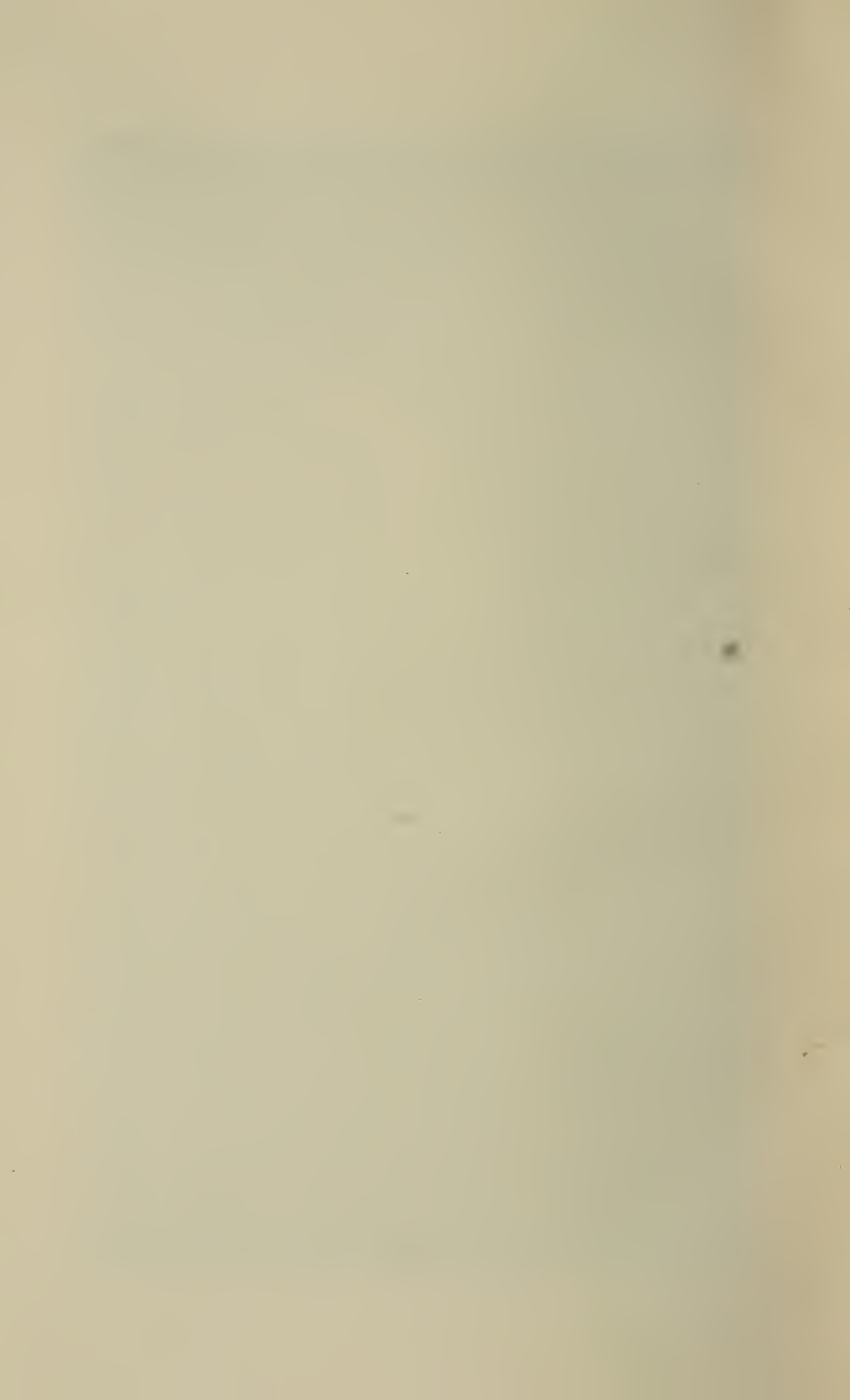
In spite of the enormous effort and large expense connected with the education of public school children in the item of physical culture, it can readily be proved scientifically and anatomically, that very few children, and not all school-teachers, are using more than a small percentage of their natural breathing capacity. Even trained athletes in many instances, from a lack of knowledge of Nature's rhythm, are reversing the function of the diaphragm, and overtaxing their lung capacity.

"He who only half breathes only half lives."

Fortunately for the rising generation, the natural rhythmic breath can easily be



A NATURAL BREATHER





WRONG WAY TO STAND AND WALK

Note the sunken chest, caused by shallow breathing, the open lips, the lack of contour and the ill-formed body.



MOUTH BREATHER. (Test case)
(Common type in public schools)



taught, and once *re-established* in the child or adult, will take care of itself automatically without conscious muscular effort.

Control of the breath means also control of the nerves, and is the secret of the calm stoicism, the dignity of bearing, the dynamic energy and splendid physical endurance of both sexes among the Oriental races.

Our conscious part in body building, such as the selection of our environment, the air we breathe, the effect of diet, etc., are important factors in their relation to the nervous system and its control of nutrition.

Nervous exhaustion is very common among brain workers of any class, and originates generally (apart from shock) in an overtaking of physical endurance. Every effort, either mental or physical, involves the expenditure of a certain amount of nerve energy, which in normal health is readily restored from day to day by proper attention to air, food, sleep and hygiene. The circulatory system follows the nervous system like its shadow, and while the nerves supply the volition and motive power of our bodies, it is the blood that supplies the nervous system with nutrition, and as the quantity and

quality of our blood is largely governed by our habits of living, the air we breathe, the food we eat and what we drink, we become to some extent our own body builders or destroyers.

A little practical investigation along these lines will soon convince the most skeptical of health and school board officials that not only has the average school child acquired the wrong method of breathing, and as a consequence is only half alive, *but that in one month's time any normal child of any age could be taught to re-establish his birthright of rhythmic breath and make rapid gain in weight and mental and physical growth.*

One of the best-known high school principals writes: "I am simply amazed at the permanent benefit I have received from rhythmic breathing. This is the greatest thing that has come into my life as a regenerating force. I wish it might be taught to all children. I am thoroughly of the belief that it would eliminate the catarrhal and pulmonary troubles characteristic of this climate."

A well-known director of music in public schools writes: "I have investigated this sys-



SHALLOW BREATHER

(Starving for oxygen.) (Test case)



SAME CHILD, TWO WEEKS LATER

(Test case)



MOUTH BREATHER. (Test case)
(Common type in public schools)



A "PREDISPOSED" TO TUBERCULOSIS CHILD AFTER TWO WEEKS'
TRAINING IN RHYTHMIC BREATHING



tem and believe it to be the most effective in placing the voice (the speaking voice and the singing voice).

"Moreover, I believe this rhythmic breath can easily be re-established in children of any age or grade and that it should be taught in every school.

"No one can estimate the value of the work to little children."

It is only recently the discovery has been made that all physical regenerating forces are correlated, and that the nervous and circulatory systems are so closely related that both are controlled by the rhythmic breath. The writer is often asked for a definition of rhythm in breathing.

In any good physiological sketch of the lungs, it will be noticed that when fully expanded the lower edges of the lungs rest upon a slightly arched muscle called the diaphragm, a muscle that divides the chest and its contents from those of the abdominal cavity.

In the rhythmic breath with which Nature endowed us all, *but which so many of us have lost or reversed*, the lower edges of the expanded lungs press downward upon this

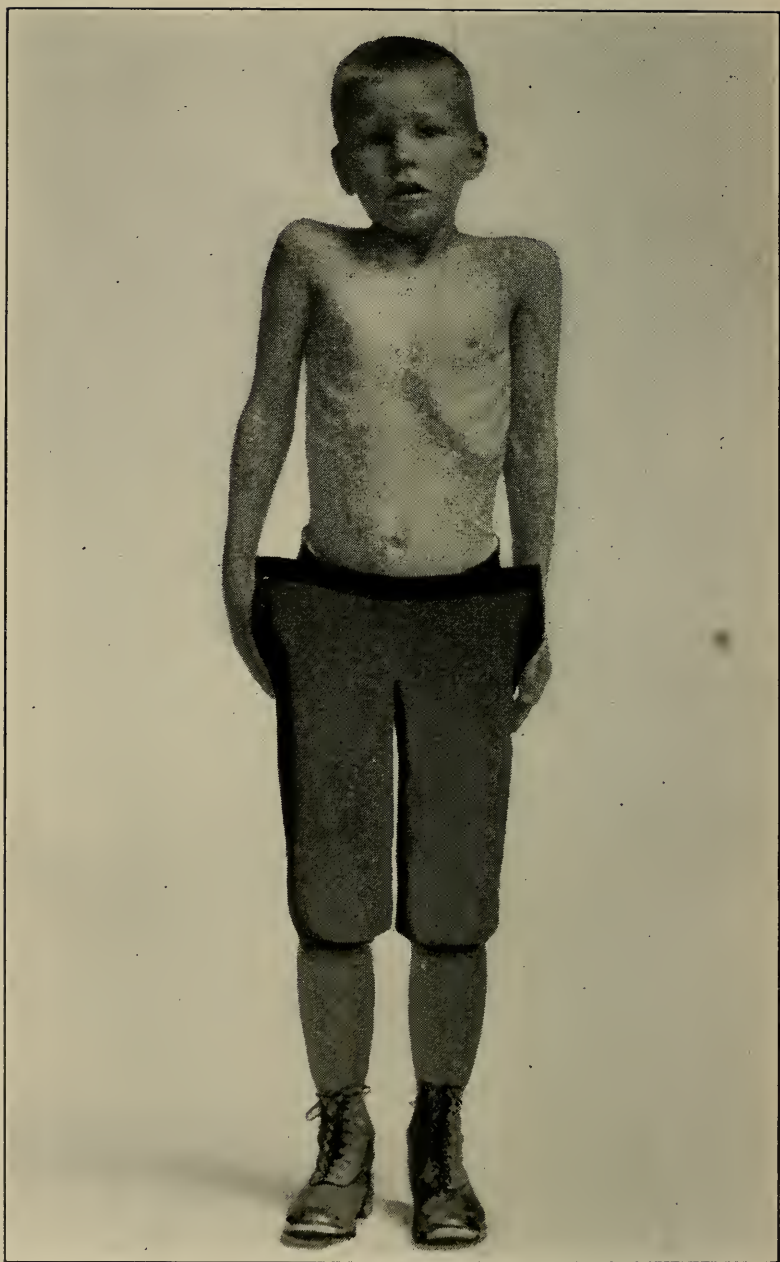
arch, causing it with every inhalation to take a rhythmic dip into the abdominal cavity, thus creating a slight movement or vibration of the contents of the abdomen and at the same time compelling a slight outward expansion of the abdominal walls. This movement is simultaneous in correct breathing with an outward expansion of all the chest diameters.

This rhythm was designed by Nature to govern nerve energy and the blood supply. Once re-established in the child or adult, it is one of the few things in life that becomes automatic and permanent.

If this explanation is not clear, notice the rhythm of a baby's bare body after its bath. In the child's unconscious expression of life it will readily be realized that rhythm is the baby's birthright.

The mysterious processes of "the house we live in" are so stupendous in their complexity that the poet Arnold in his "Light of Asia" has well described them as "wonderful, subtle, sacred."

For the people of the Western world we do not advocate the Yogi system of breathing, so commonly used for concentration and



SHALLOW BREATHER
(Starving for oxygen)



SAME BOY, AFTER THREE WEEKS' TUITION IN RHYTHMIC BREATHING. (*Test case.* All test cases are made under Board of Health supervision)



A DEFECTIVE BREATHER

(Before)



SAME GIRL

(After two weeks' tuition in rhythmic breathing)



meditation exercises by the monks and ascetics of the religious brotherhoods of India. The word *Yogi* means "to join together." It is connected with breathing exercises in India for arousing the psychic or spiritual side of the nature, and is only suited to people who are no longer concerned with the hurry of labor and rush of feet in the work-a-day world.

In India the *Yogi* breath is used exclusively by those qualifying for the religious life.

For further elucidation on better lung development for children, study carefully preceding chapter on *Olfactory Nerve Influence on Respiration*. The cuts accompanying this chapter are test cases of recent date. For details see end of book.

LESSON 4

FIRST AID FOR PREVENTION OF CATARRH AND PULMONARY AFFECTIONS

“We grasp at shadows, and lose the substance.”—*Handel*.

IN a pamphlet recently published by a lay organization in a large city for the use of teachers on the prevention of tuberculosis, one reads: “The struggle with tuberculosis demands the mobilization of all social forces, public and private, official and voluntary,” and the statement is made that tuberculosis is not hereditary, contagious, or incurable; then follow some suggestions with regard to diet, habits and care of the consumptive; street cleaning, and methods for prevention, etc. And yet, although these instructions are issued for the use of *school-teachers*, not a word is said, or suggestion made, as to correct breathing for children—the *only really scientific key to the prevention of pulmonary troubles and tuberculosis generally*.

It is a well-established fact that even in

these days every child is born using its full lung capacity. *It loses this power in its early school days*, through lack of care and training on the part of its parents and teachers, and as a consequence grows up using only about one-sixth part of its lung capacity. Unfortunately, through lack of knowledge, many of the parents and teachers are doing no better than the children in the matter of breathing, the majority of them using their upper chest breath instead of the full lung rhythm. *The rhythmic breath*, which every one is born with, means a constant, though subconscious, rhythm of the whole body, by which the lungs gain more elasticity, *and a rhythmic descent of the diaphragm is compelled with every breath*. This moves every internal organ and controls the circulation of the blood, and enables the lungs to eliminate, without undue chest expansion, about thirty per cent. of the waste material of the body in the form of poisonous vapor, which is constantly generating in the system through its electro-chemic processes. There are only three sources of life—food, air and water—breathing controls them all.

Respiratory exercises and correct breath-

ing is an absolute preventative of pulmonary troubles.

As a result of the author's studies in the far East, now embodied in a simple, though scientific, "Method for the Millions," who only half breathe, any one can readily learn how to re-establish (without muscular effort) the rhythmic breath which is our birthright. We have no hesitation in making this statement, because this knowledge of correct breathing was gained during a long sojourn in a country inhabited by about four hundred million people, where children are taught the daily habit of full lung inflation as a religious duty, and it goes without saying that nasal diseases and pulmonary troubles among these people are comparatively rare, and this in a tropical climate, where lack of water and proper sanitation make it one of the most undesirable on earth.

Metchnikoff in his book, "The Nature of Man," endeavors to solve the problem of old age by calling our attention to the phagocytes which exist from birth to death in the human body in uncountable numbers, and whose function in the "house fashioned for man" make them "the scavengers of the

human system." In normal health these phagocytes kill all the invading disease germs and devour them. A part of their function also is to rebuild impaired tissues and to prevent the entrance of disease germs into the blood stream. When by *correct breathing and dieting we keep the blood normal in its quality and activity*, we give the phagocytes less to do, and can thus utilize their energy in the cellular nutrition of the body and give ourselves no anxiety about the advancing years.

In the upbuilding of the human body man has more hidden forces to contend with than mere bacteria. He has within himself electro-chemic processes in constant activity which are stupendous in their complexity.

Brunton says, in his "Lectures on the Action of Medicines," "the saliva in some stages of disease in man is as poisonous as the venom of a serpent, and the juices of various human glands, when injected directly into the blood, will kill an animal as quickly as a rifle bullet."

In "Man and His Poisons," Dr. Abrams says, "The human body is a laboratory of deadly poisons—hydrochloric acid in the

stomach, potassium sulpho-cyanide in the saliva, and phosphorus in the blood and bones." And yet in normal health all these are rendered innocuous by physiologic metabolism—in other words, electro-chemic energy.

It is only in cases of debilitated or impaired nutrition that infection from any source is possible.

There are only three sources of life—food, water and fresh air, and the nearer the consumptive gets to the magnetized bosom of mother earth, lives the simple life, eats simple food, throws alcohol and physic to the dogs, and inbreathes the sun-electrified atmosphere until his whole being rhythms and pulsates with oxygen, laden with life principles (generated every moment of time through solar and terrestrial affinity), the better chance he has for a complete recovery. The germ of tuberculosis is no respecter of persons. No disease is more fatal. It causes more deaths annually than any known disease. The tubercle bacilli—ten thousand of which can crowd into one inch of space—take nearly a year to fully develop in the human body, but five hours' exposure to

strong light will kill them. *The disease is infectious and a source of great public danger, especially in overcrowded districts.* All who are interested in its cause and prevention should have the earnest support of the public. Parents should never neglect the tendency of children to *catch cold easily*.

Prevention is better than cure, and the natural guardians of children should especially teach them the *value of deep breathing and personal hygiene*. In children predisposed to lung trouble, ordinary colds sometimes run into tuberculosis. Signs of early stages are fever, increasing debility, loss of weight, flushed cheeks, unusually bright eyes, cough and poor appetite. It is an encouraging sign of progress that the masses are beginning to be willing to be educated in the matter of personal hygiene and prevention of disease. In former days disease was tolerated and looked upon as a special dispensation of providence.

One of the best aids for the prevention of this loathsome disease is the spread of knowledge among the masses. They *must be taught* how to take a hand in "*first aid*," and be educated in the simple laws of health.

Up to date there is no known drug that will cure tuberculosis. Expert knowledge has too long been obscured in technicalities. The time is already here when medical men have laid aside some of the old-time prejudices. The day is not far distant when it will no longer be a part of medical ethics to write a prescription for a simple pill in a classic language.

Medical men of the twentieth century are gaining more social and scientific recognition than at any period of the world's history, and apart from their indefatigable research along the lines of cause and cure of tuberculosis, are nobly taking their share in educating the masses for its prevention.

How necessary, then, to have our children taught something of the marvelous phenomena, of momentary occurrence, in their own bodies; of the origin of the two sources of physical life, and how correct and *natural* breathing controls them both, and that normal health is a matter of self-building.

Let us, too, teach the rising generation of human toilers that if they must crowd into big cities to fill the demands of corporations for labor, to exact a rightful claim to decent

housing, even in tenements, to insist on pure water for drinking and a goodly supply for bathing purposes, hygienic environment and less adulteration in food, better ventilation in the workshops, shorter hours for women and children, more open spaces for children's playgrounds, and, above all, to claim that the health departments of cities prevent the awful menace to health by pollution of the atmosphere, caused by dust, filthy streets, noxious gases and the use of bituminous fuel. Ways and means for full combustion of fuel are cheap, and railroad authorities, manufacturers and others should be compelled by law to do their share in cleaning up the atmosphere of the city that the lungs of the poor may have fair play.

LESSON 5

THE CELLULAR PROCESS OF BODY BUILDING, AND HOW IT IS GOV- ERNED BY OUR HABITS OF LIVING

“Nature has done her best; do thou thine.”—*Milton*.

MODERN science has conclusively proved that all forces are correlated, and that the creative and destructive forces are equally active in the human system.

There is no longer any scientific doubt about the cellular reconstruction of the human body. The microscope proves that the human body is composed of myriads of smaller bodies, or cells, uncountable numbers of which are in constant activity, either breaking down or reconstructing, each class of cells having functions all its own, not all of which are, even in this twentieth century, fully understood. But there is no longer any doubt that the life of each cell is very short, and that human life depends on the constant reconstruction of healthy cells.

Our habits of living naturally affect this process. Self-control and well-directed energy exercise a powerful though silent influence over the cellular process of body building.

The English poet, Tennyson, in his poem called "The Leper," gives a very gloomy view of the human body. He speaks of it as "the rib-grated dungeon of the soul," as "a little city of sewers, with all its wants and needs, no greater than the beast," and bewails the ills that flesh is heir to.

Another English poet, in happier mood, writes:

"Not mean, nor base, but of God's best upbuilding, is this house fashioned for man—the city of nine gates, wonderful, subtle, sacred."

We should never lose sight of the fact that it is possible to have a healthy body and to cultivate a happy, sunny temperament.

Except in cases of hereditary disease, we are undoubtedly largely responsible for the health or disease of our bodies.

When we permit the grosser instincts and appetites of the flesh to gain the ascendancy, body rules the soul, and obscures or hinders

its development; for how can the soul attain its heights if its earthly limit is dwarfed by impure desire and uncontrolled appetites, which, alas, are too often the real cause of pain and disease.

It rests with us to keep the river of life properly supplied with life principles, through atmospheric contact and proper food, and to see that its channels and byways are kept free from accumulating debris.

The all-wise Creator designed for our bodies a more marvelously perfect system of irrigation, drainage and sewerage than mortal mind has ever dreamed of, and by which it was intended the natural waste products of the body should be carried off, but which, through ignorance, and sometimes wilful neglect, are allowed to accumulate in the system and become a fertile source of disease.

In nearly every instance the impaired function of the stomach is the starting point for disease of the whole system, because every cell, nerve, fiber and tissue of the body depends for its nutrition upon the quality of the material absorbed from the blood.

Overwork, a deficient supply of food, and

lack of sufficient outdoor life delays and impairs the processes of nutrition seriously.

In normal health our blood is always propagating myriads of living warriors called phagocytes, who combine the triple duties of war on invading germs, building and repairing tissue, and helping to dispose of the debris in the blood stream.

RECONSTRUCTION OF THE BODY

It used to be dimly conceded that the human body changed, or was made over, about once in seven years; we know now that it is changing every moment of time until our last breath ends the process of momentary building up or breaking down. All of Nature's forces are correlated. And the creative and destructive forces (in normal health) are equally active in the human system.

Professor Metchnikoff (of Pasteur Institute, Paris) may be considered as among the most distinguished living authorities on all sorts and conditions of microbes. His recent microscopic discoveries prove that the blood stream of the living body swarm with uncountable numbers of red and white cor-

puscles. The red predominate in number, and their function is said to be to convey oxygen from the lungs to the tissues (it is more than likely they have a double function, but that remains to be proved). The white corpuscles vary in shape and independence of movement. They are constantly pervading all the tissues of the body, apparently searching for germs of disease, which it is their special function to destroy and devour. Professor Metchnikoff believes it is possible to develop in the human system harmless and beneficial microbes that would arrest precocious senility. He believes they can be found in buttermilk and sour milk, the use of which he says would be a useful adjunct in a simple dietary. He also advocates abstinence from alcohol, animal food and uncooked fruit for those no longer young. Modern science is advancing the theory that superfluous food in the system is the cause of arterial degeneration, and it is believed that further investigations along the lines of bacteriological research will discover the germ of old age and means for its destruction.

If disease and old age are caused by in-

activity of the blood stream and lack of oxygen, it is a rational supposition that disease can be prevented and old age postponed by a sufficient supply of oxygen to keep all the lung cells in constant use.

The rhythmic law of expansion and contraction is far reaching. It not only controls the equipoise of the universe, but rhythm in breathing regulates the blood stream and all the organs of secretion and elimination of the human body.

The latest scientific research classes bacteria as among the most active but lowest order of vegetation, chiefly fungi.

They begin existence as single-cell growths and multiply by a process called fission, which means that after a short period of growth a fissure divides the original cell. They are infinitesimally small, live by absorption, and reproduce themselves at a very early stage in their history; some reproduce in spores, or tiny seed-like granules, none of which are visible to the naked eye. Some germs multiply every thirty minutes, which means a propagation of almost inconceivable rapidity. Under the microscope, bacteria differs in form. Some are spiral, some look

like tiny dots or pin-heads, others like tiny tubes with round or pointed ends; germs of tropical diseases differ in form from those of cooler climates. Some germs exist only in dead or decaying vegetable matter; others exist only in the tissues, lymphatics and blood stream of the human being.

Like all seed life, they can only exist in suitable soil and environment. The practical prevention of disease lies not so much in fighting bacteria as in controlling and fortifying the process of body building against its invasion.

When the circulation of the blood becomes sluggish, there is too little activity of the capillary system, which is closely connected with the circulation of the whole body.

Also, not far beneath the skin, the body is covered with a wondrous network of minutest tubings, ending in myriads of pores, through which, in the form of perspiration, a large amount of waste material should be daily thrown off from the system.

Sudden closing or congestion of these pores of the skin is the cause of colds, and many of the ills which flesh is heir to; hence the imperative necessity for keeping the nat-

ural *drainage* of the body in unimpaired condition.

Scientific investigation proves that only one or two per cent. of people in the Occident use their full lung capacity. Only very strong people breathe deeply, or compel the constant rhythmic descent of the diaphragm with every breath. In India the elephant is everywhere recognized as the symbol of power, and he is the slowest-breathing animal on earth, taking only about five or six respirations a minute; and as the blood depends upon the breath for the most important of its vital principles, and the act of breathing makes us one with pure atmosphere, or the reeking poison of ill-ventilated rooms, it rests with ourselves to govern the quality and quantity of the air we breathe, as well as the appropriation to ourselves of a larger or lesser amount of its life-giving principles. By correct breathing we govern every function of the body, increasing their activity, and controlling their processes; respiratory exercises are absolutely necessary in preventing disease and to help the lungs exhale and eliminate poisons constantly generating through electro-chemic action in the system.

It is more practical and rational to recognize a diseased condition, and help it, than it is merely to think we can get well by denying its existence.

From the earliest ages, people of the far East have understood the great electrical energy bound up in the sun, its influence on the atmosphere of our world and health of the human race.

In manuscripts scratched with thorns upon green palm leaves thousands of years ago the sun is given a thousand names of adoration. He is described as a chariot of fire, with three wheels, one hot, one light, and one electrical, and as being driven with seven horses, each of a different color, symbolic of the solar spectrum. They consider our earth its negative pole, and teach that nearly every known substance of the earth is found floating in the atmosphere in a rarefied form, attracted thither by solar energy and held there in chemical affinity with other life-giving elements. And, because they have such a profound understanding of these laws, the Hindus believe that *breath is life*, which is why they attach such importance to the normal rhythm of breathing.

LESSON 6

“SIMPLIFIED” DIETETICS

“Wherefore did Nature pour her bounties forth
With such a full and unwithdrawing hand,
Covering the earth with odors, fruits, and flocks,
Thronging the seas with spawn innumerable,
But all to please and sate the curious taste?” . . .
—Milton’s “Comus.”

SIR HENRY THOMPSON has said “almost all diet reformers have been extreme in their views, and most of them have died early.”

In selecting our diet it is well to remember that of *the fourteen elements that constitute the human body*, it is not difficult to find them in very simple foods—for example, a grain of wheat contains every one of them.

Diet should be studied in order that we may combine in *suitable selection to individual needs*, the *phosphates* which are needed in the blood, as nutrient to brain, bones and nerves, the *nitrates* for muscle building, and *carbonates* for necessary heat.

Food stuffs have all come to be classed

under three headings: Proteids, carbohydrates and fats.

Professor Russell H. Chittenden, director of the Sheffield Scientific School of Yale University, Department of Physiological Chemistry, has recently given to the public the result of the many important dietary experiments he has been engaged upon for the last six years. As the result of scientific investigation he has become convinced that the average person eats far too much meat and that we all eat too rapidly. He does not believe in vegetarianism or Fletcherism, but advocates variety in diet, a diet based on the body's real needs.

Professor Chittenden says: "The facts bearing on food requirements, especially those that relate to the need for proteid food, are seemingly harmonious in indicating that the physiological necessities of the body are fully met by a much more temperate use of food than is commonly practiced.

"Dietary standards based on the habits and usages of prosperous communities are not in accord with the data furnished by exact physiological experimentation. Nitrogenous equilibrium can be maintained on

quantities of proteid food fully fifty per cent. less than the every-day habits of mankind imply to be necessary, and this without increasing unduly the consumption of non-nitrogenous food."

The experiments at Yale by Professor Irving Fisher, by which he showed that the meat eaters employed in those experiments had less endurance than vegetarians, have been widely accepted as arguments in favor of vegetarianism, but the most significant experiments were those in which the wonderful increase of endurance which followed all cases where *thorough mastication* of food was practiced. Professor Fisher does not advocate vegetarianism. He says on this point, that meat is sometimes essential, and experiments indicate that complete vegetarianism is entirely successful in some cases and quite disastrous in others. Vegetarianism is an exclusive vegetable diet, and arguments in its favor are mainly ethical or sentimental. What is really needed is a varied mixed diet.

The main thing to avoid in selecting one's nutrition is the habit of eating large quantities of proteid or tissue-building food. While the proteids are almost indispensable in

body building, it is possible that after the average growth has been attained proteids are not completely utilized by the body and increase the waste matter in the system, giving the liver and kidneys much extra work, thus rendering the body less able to resist disease.

Professor Chittenden says: "The appearance, odor and palatability of food are factors of prime importance in its utilization by the body, and that the æsthetics of eating are not to be ignored, since they have an important influence upon the flow of the digestive secretions. A peaceful mind, pleasurable anticipation, freedom from care and anxiety, cheerful companionship, all form desirable table accessories, which play the part of true psychical or mental stimuli in accelerating the flow of the digestive juices. Thorough mastication prolongs mechanical stimulation of the salivary glands and thus increases the flow of the secretion."

As a digestive secretion, saliva serves several important purposes. By moistening the food it renders mastication and swallowing easy. Its natural alkalinity tends to neutralize such acidity as may be present in the food.

It dissolves various solid substances, thus making a solution capable of stimulating the taste nerves. Last and most important, it has a marked digestive and solvent action on starchy foods. A large proportion of the food, other than meat, eggs, etc., consumed by the average person is composed of some form of starch, and this the body cannot make use of until it has undergone conversion into soluble forms, such as dextrins and sugars. This it is the function of saliva to accomplish.

Horace Fletcher's dietetic rule reads, "Do not eat when you are mad or sad, only when you are glad."

Horace Fletcher was the first practical demonstrator of the science of simple living which now bears his name. He, too, experimented at Yale University under the direction of Professor Russell H. Chittenden. Three groups of men—a company of regular United States soldiers, a number of professors and some athletes in training—lived on a simple restrictive diet for six months. They were all stronger at the end of the experiment than they were at the beginning, and their working efficiency was increased

from fifty to two hundred per cent. The most important development of Fletcherism of recent date has been the report of Dr. Hubert Higgins, of May 20 and 27, 1905, in the London *Lancet*, on the chewing and swallowing apparatus in man, which corroborates a most important anatomical discovery made by Mr. Fletcher some years ago of what he termed a food filter in man, situated at the back of the mouth. Later investigation of this method by professors of universities abroad and at home by the aid of recording appliances proves that there is a discriminating or filtering mechanism at the back of the mouth, which works perfectly in its selection of food suited for digestion and assimilation when conditions are normal. *The writer begs leave to call attention to the fact that fresh and constantly changing air, laden with its life-giving oxygen, is not ordinarily classed with food, but without it there can be no perfect electro-chemic assimilation of food structures in the blood.*

Professor Dr. Lloyd M. Campbell, New York County Medical Society, says: "The character of a person's food should vary with age, climate, season, occupation and tem-

perament. No one system of diet or class of food is adapted for all. Food as a builder of brain and nerve tissue wields a direct influence on character, the failure to properly nourish the brain or reinforce the nerve centers resulting very often in the complete change of a man's personality."

A. E. Baines, an English authority on food reform, has demonstrated by means of a galvanometer of remarkable sensitiveness, that all fruits, nuts and vegetables are, while alive, *storage batteries of electricity*. When they die or are killed by cooking, the insulation between the negative and the positive systems is destroyed. In an orange, Mr. Baines asserts, each alternate section is a charged cell, which will cause the galvanometer to record a current.

Dr. Alexander Haig, of London, has shown that uric acid, which abounds in flesh foods, can also be found to a limited extent in the hulls of beans and grain and to a larger extent in tea, coffee and cocoa.

It should be remembered, then, that uric acid, like other toxic products, may be formed in the system even if no meat is eaten. Some people condemn the use of

meat altogether, and claim that flesh is not fit to eat under any circumstances. Against that many dieticians will agree, especially in cases of convalescence, that liquid meat broths or beef tea can be assimilated when the stomach cannot retain ordinary food. All dietetics are subject to exceptions and qualifications according to circumstances. As a rule, acids are the most frequent cause of disturbed digestion of any class of dietetic agents.

A white coated tongue is always the first sign of an acid stomach. When persistent, acid-producing elements, such as fruit acids, should be eliminated from the diet, and fruit should only be eaten in its cooked form.

The question of diet is one that is attracting a great deal of public attention. On all sides the claim is made by modern writers that people eat too much. That depends, of course, on what class of people the writers have in mind.

One-half the world may be suffering from disturbed digestion due to over-eating and indulgence of the appetites. The chances are, however, that the other half rarely get enough to eat, especially of properly selected foods.

Mental and moral degeneracy exists to an alarming extent in industrial centers where child-labor is tolerated, *as a direct result of poverty and insufficient food.* Recent available data, tend to prove that not less than two million of children of school age in the United States alone are victims of poverty, which deny them the common necessities of life. Such statistics give us food for thought. In the human body nutrition serves two distinct purposes, which are always in constant affinity—the constant reconstruction of cellular tissue and the renewal of vital energy. The three great reservoirs from which the human being draws for its existence are air, food and water. Of these, air—because of its electrical principles—is by far the most important. The better we breathe, the more we get of its vital energy for utilizing in our blood the chemical changes of our food products. Proper nutrition is not wholly possible, even with choicest selection of food, unless sufficient oxygen is inspired.

It is an interesting fact that no matter what our weight may be, its bulk is always (in normal health) two-thirds water. Therefore, aside from water contained in all food

stuff, we should drink water freely. Always boil and cool water if there is any question as to its purity. The Oriental never tastes raw water, which is why even in this country John Chinaman always keeps up a goodly supply of weak tea. Water is both a solvent and the distributer and regulator of the heat of the body.

"There is no agent," writes Dr. James Wilson, "applied to the human body, externally or internally, that has such influence in awakening all the vital powers to their great restorative capabilities, in arresting the progress of disease or preventing a fatal termination as pure water. Administered at various temperatures, it is the most powerful remedy we possess as a stimulant, a sedative, a diuretic, a sudorific. When we turn to the physiological construction, either of man or of the lower animal, we discover nothing that can lead us to conceive the necessity for any other fluid than that which nature has provided."

The simplicity of the diet of the Orientals is the basis of their physical endurance and unusual recuperative power. The writer has in mind two Chinese laboring men, who were in a hospital in this country under treatment,

one for fractured skull and the other a double fracture of the leg. Neither of them were young or over-nourished, but each made a rapid and perfect recovery on a most simple diet. For the first week nothing was given them but rice water of varying thickness. Later boiled rice and a little gravy and cooked fruits. Very weak tea, hot or cold, fruit juices and boiled water were the only beverages.

Pythagoras lived and taught the simple life and diet six hundred years before Christ. In all topics of vital interest history repeats itself in cycles. 600 B. C. Pythagoras was known in his day not only as a great naturalist and philosopher, but as the greatest authority on the subject of health through diet and exercise and control of breath. He established a system of *simple dietetics* and *taught prevention rather than cure of disease*. He advocated a general use of milk, honey, grains, fruits, roots, vegetables, etc., and especially a liberal use of pure water.

The following table prepared by the United States Department of Agriculture, Washington, D. C., gives average composition of common American food products:

Table prepared by U. S. Government, Dept. of Agriculture, Wash, D. C.

TABLE I
AVERAGE COMPOSITION OF COMMON AMERICAN FOOD PRODUCTS

Food Materials (as purchased)	Ref- use	Water	Pro- tein	Fat	Carbo- hydrates	Ash	Fuel Value per Pound
ANIMAL FOOD	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Calo- ries
Beef, fresh:							
Chuck ribs.....	16.3	52.6	15.5	15.0	.....	0.8	910
Flank	10.2	54.0	17.0	19.0	.....	.7	1,105
Loin	13.3	52.5	16.1	17.5	.....	.9	1,025
Porterhouse Steak.....	12.7	52.4	19.1	17.9	.....	.8	1,100
Sirloin Steak.....	12.8	54.0	16.5	16.1	.....	.9	975
Neck	27.6	45.9	14.5	11.9	.....	.7	1,165
Ribs	20.8	43.8	13.9	21.2	.....	.7	1,135
Rib rolls .....	.....	63.9	19.3	16.7	.....	.9	1,055
Round	7.2	60.7	19.0	12.8	.....	1.0	890
Rump	20.7	45.0	13.8	20.2	.....	.7	1,090
Shank, fore.....	36.9	42.9	12.8	7.3	.....	.6	545
Shoulder and clod.....	16.4	56.8	16.4	9.8	.....	.9	715
Fore quarter.....	18.7	49.1	14.5	17.5	.....	.7	995
Hind quarter.....	15.7	50.4	15.4	18.3	.....	.7	1,045
Beef, corned, canned, pickled and dried:							
Corned beef.....	8.4	49.2	14.3	23.8	.....	4.6	1,245
Tongue, pickled.....	6.0	58.9	11.9	19.2	.....	4.3	1,010
Dried, salted and smoked.	4.7	53.7	26.4	6.9	.....	8.9	790
Canned boiled beef.....	.....	51.8	25.5	22.5	.....	1.3	1,410
Canned corned beef.....	.....	51.8	26.3	18.7	.....	4.0	1,270
Veal:							
Breast	21.3	52.0	15.4	11.0	.....	.8	745
Leg	14.2	60.1	15.5	7.9	.....	.9	625
Leg cutlets.....	3.4	63.3	20.1	7.5	.....	1.0	695
Fore quarter.....	24.5	54.2	15.1	6.0	.....	.7	535
Hind quarter.....	20.7	56.2	16.2	6.6	.....	.8	580
Mutton:							
Flank	9.9	39.0	13.8	36.9	.....	.6	1,770
Leg, hind.....	18.4	51.2	15.1	14.7	.....	.8	890
Loin chops.....	16.0	42.0	13.5	28.3	.....	.7	1,415
Fore quarter.....	21.2	41.6	12.3	24.5	.....	.7	1,235
Hind quar., without tallow.	17.2	45.4	13.8	23.2	.....	.7	1,210
Lamb:							
Breast	19.1	45.5	15.4	19.1	.....	.8	1,075
Leg, hind.....	17.4	52.9	15.9	13.6	.....	.9	860
Pork, fresh:							
Ham	10.7	48.0	13.5	25.9	.....	.8	1,320
Loin chops.....	19.7	41.8	13.4	24.2	.....	.8	1,345
Shoulder	12.4	44.9	12.0	29.8	.....	.7	1,450
Tenderloin .....	.....	66.5	18.9	13.0	.....	1.0	895
Pork, salted, cured, pickled:							
Ham, smoked.....	13.6	34.8	14.2	33.4	.....	4.2	1,635
Shoulder, smoked.....	18.2	36.8	13.0	26.6	.....	5.5	1,335
Salt pork.....	.....	7.9	1.9	86.2	.....	3.9	3,555
Bacon, smoked.....	7.7	17.4	9.1	62.2	.....	4.1	2,715
Sausage:							
Bologna	3.3	55.2	18.2	19.7	.....	3.8	1,155
Pork .....	.....	39.8	13.0	44.2	1.1	2.2	2,075
Frankfort .....	.....	57.2	19.6	18.6	1.1	3.4	1,155
Soups:							
Celery, cream of.....	.....	88.6	2.1	2.8	5.1	1.5	235
Beef .....	.....	92.9	4.4	.4	1.1	1.2	120

TABLE I—CONTINUED

Food Materials (as purchased)	Ref- use	Water	Pro- tein	Fat	Carbo- hydrates	Ash	Fuel Value per Pound
ANIMAL FOOD— <i>Continued</i>	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Calo- ries
Soups:							
Meat stew.....	.....	84.5	4.6	4.3	5.5	1.1	365
Tomato .....	.....	90.0	1.8	1.1	5.6	1.5	185
Poultry:							
Chicken, broilers.....	41.6	43.7	12.8	1.4	.....	.7	305
Fowls	25.9	47.1	13.7	12.3	.....	.7	765
Goose	17.6	38.5	13.4	29.8	.....	.7	1,475
Turkey	22.7	42.4	16.1	18.4	.....	.8	1,060
Fish:							
Cod, dressed.....	29.9	58.5	11.1	.2	.....	.8	220
Halibut, steaks or sections.	17.7	61.9	15.3	4.4	.....	.9	475
Mackerel, whole.....	44.7	40.4	10.2	4.2	.....	.7	370
Perch, yellow, dressed....	35.1	50.7	12.8	.7	.....	.9	275
Shad, whole.....	50.1	35.2	9.4	4.8	.....	.7	380
Shad, roe.....	.....	71.2	20.9	3.8	2.6	1.5	600
Fish, preserved:							
Cod, salt.....	24.9	40.2	16.0	.4	.....	18.5	325
Herring, smoked.....	44.4	19.2	20.5	8.8	.....	7.4	755
Fish, canned:							
Salmon .....	.....	63.5	21.8	12.1	.....	2.6	915
Sardines	*5.0	53.6	23.7	12.1	.....	5.3	950
Shellfish:							
Oysters, "solids".....	.....	88.3	6.0	1.3	3.3	1.1	225
Clams .....	.....	80.8	10.6	1.1	5.2	2.3	340
Crabs	52.4	36.7	7.9	.9	.6	1.5	200
Lobsters	61.7	30.7	5.9	.7	.2	.8	145
Eggs: Hen's eggs.....	†11.2	65.5	13.1	9.3	.....	0.9	635
Dairy products, etc.:							
Butter .....	.....	11.0	1.0	85.0	.....	3.0	3,410
Whole milk.....	.....	87.0	3.3	4.0	5.0	.7	810
Skim milk.....	.....	90.5	3.4	.3	5.1	.7	165
Buttermilk .....	.....	91.0	3.0	.5	4.8	.7	160
Condensed milk.....	.....	26.9	8.8	8.3	54.1	1.9	1,420
Cream .....	.....	74.0	2.5	18.5	4.5	.5	865
Cheese, cheddar.....	.....	27.4	27.7	36.8	4.1	4.0	2,075
Cheese, full cream.....	.....	34.2	25.9	33.7	2.4	3.8	1,885
VEGETABLE FOOD							
Flour, meal, etc.:							
Entire-wheat flour.....	.....	11.4	13.8	1.9	71.9	1.0	1,650
Graham flour.....	.....	11.3	13.3	2.2	71.4	1.8	1,645
Wheat flour, patent roller process—							
High-grade and medium. .	.....	12.0	11.4	1.0	75.1	.5	1,635
Low-grade .....	.....	12.0	14.0	1.9	71.2	.9	1,640
Macaroni, vermicelli, etc..	.....	10.3	13.4	.9	74.1	1.3	1,645
Wheat breakfast food.....	.....	9.6	12.1	1.8	75.2	1.3	1,680
Buckwheat flour.....	.....	13.6	6.4	1.2	77.9	.9	1,605
Rye flour.....	.....	12.9	6.8	0.9	78.7	.7	1,620
Corn meal.....	.....	12.5	9.2	1.9	75.4	1.0	1,635
Oat breakfast food.....	.....	7.7	16.7	7.3	66.2	2.1	1,800
Rice .....	.....	12.3	8.0	.3	79.0	.4	1,620
Tapioca .....	.....	11.4	.4	.1	88.0	.1	1,650
Starch .....	.....	.....	.....	.....	90.0	.....	1,675
Bread, pastry, etc.:							
White bread.....	.....	35.3	9.2	1.3	53.1	1.1	1,200

*Refuse, oil.

†Refuse, shell.

TABLE I—CONTINUED

Food Materials (as purchased)	Ref- use	Water	Pro- tein	Fat	Carbo- hydrates	Ash	Fuel Value per Pound
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Calo- ries
VEGETABLE FOOD—Continued							
Bread, pastry, etc.:							
Brown bread.....		43.6	5.4	1.8	47.1	2.1	1,040
Graham bread.....		35.7	8.9	1.8	52.1	1.5	1,195
Whole-wheat bread.....		38.4	9.7	.9	49.7	1.3	1,130
Rye bread.....		35.7	9.0	.6	53.2	1.5	1,170
Cake		19.9	6.3	9.0	63.3	1.5	1,630
Cream crackers.....		6.8	9.7	12.1	69.7	1.7	1,925
Oyster crackers.....		4.8	11.3	10.5	70.5	2.9	1,910
Soda crackers.....		5.9	9.8	9.1	73.1	2.1	1,875
Sugars, etc.:							
Molasses					70.0		1,225
Candy*					96.0		1,680
Honey					81.0		1,420
Sugar, granulated.....					100.0		1,750
Maple syrup.....					71.4		1,250
Vegetables:†							
Beans, dried.....		12.6	22.5	1.8	59.6	3.5	1,520
Beans, Lima, shelled.....		68.5	7.1	.7	22.0	1.7	540
Beans, string	7.0	83.0	2.1	.3	6.9	.7	170
Beets	20.0	70.0	1.3	.1	7.7	.9	160
Cabbage	15.0	77.7	1.4	.2	4.8	.9	115
Celery	20.0	75.6	.9	.1	2.6	.8	65
Corn, green (sweet), ed- ible portion.....		75.4	3.1	1.1	19.7	.7	440
Cucumbers	15.0	81.1	.7	.2	2.6	.4	65
Lettuce	15.0	80.5	1.0	.2	2.5	.8	65
Mushrooms		88.1	3.5	.4	6.8	1.2	185
Onions	10.0	78.9	1.4	.3	8.9	.5	190
Parsnips	20.0	66.4	1.3	.4	10.8	1.1	230
Peas (<i>Pisum sativum</i>), dried		9.5	24.6	1.0	62.0	2.9	1,565
Peas (<i>Pisum sativum</i>), shelled		74.6	7.0	0.5	16.9	1.0	440
Cowpeas, dried		13.0	21.4	1.4	60.8	3.4	1,505
Potatoes	20.0	62.6	1.8	.1	14.7	.8	295
Rhubarb	40.0	56.6	.4	.4	2.2	.4	60
Sweet potatoes	20.0	55.2	1.4	.6	21.9	.9	440
Spinach		92.3	2.1	.3	3.2	2.1	95
Squash	50.0	44.2	.7	.2	4.5	.4	100
Tomatoes		94.3	.9	.4	3.9	.5	100
Turnips	30.0	62.7	.9	.1	5.7	.6	120
Vegetables, canned:							
Baked beans		68.9	6.9	2.5	19.6	2.1	555
Peas (<i>Pisum sativum</i>), green		85.3	3.6	.2	9.8	1.1	235
Corn, green.....		76.1	2.8	1.2	19.0	.9	430
Succotash		75.9	3.6	1.0	18.6	.9	425
Tomatoes		94.0	1.2	.2	4.0	.6	95
Fruit, berries, etc., fresh:							
Apples	25.0	63.3	0.3	0.3	10.8	0.3	190

*Plain confectionery not containing nuts, fruit or chocolate.

†Such vegetables as potatoes, squash, beets, etc., have a certain amount of inedible material—skin, seeds, etc. The amount varies with the method of preparing the vegetables, and cannot be accurately estimated. The figures given for refuse of vegetables, fruits, etc., are assumed to represent approximately the amount of refuse in these foods as ordinarily prepared.

TABLE I—CONTINUED

Food Materials (as purchased)	Ref- use	Water	Pro- tein	Fat	Carbo- hydrates	Ash	Fuel Value per Pound
VEGETABLE FOOD—Continued	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Calo- ries
Fruits, berries, etc., fresh:*							
Bananas	35.0	48.9	.8	.4	14.3	.6	260
Grapes	25.0	58.0	1.0	1.2	14.4	.4	295
Lemons	30.0	62.5	.7	.5	5.9	.4	125
Muskmelons	50.0	44.8	.3	.....	4.9	.3	80
Oranges	27.0	63.4	.6	.1	8.5	.4	150
Pears	10.0	76.0	.5	.4	12.7	.4	230
Persimmons, edible port'n. ....	.....	66.1	.8	.7	31.5	.9	550
Raspberries .....	.....	85.8	1.0	.....	12.6	.6	220
Strawberries	5.0	85.9	.9	.6	7.0	.6	150
Watermelons	59.4	37.5	.2	.1	2.7	.1	50
Fruits, dried:							
Apples .....	.....	28.1	1.6	2.2	66.1	2.0	1,185
Apricots .....	.....	29.4	4.7	1.0	62.5	2.4	1,125
Dates	10.0	13.8	1.9	2.5	70.6	1.2	1,275
Figs .....	.....	18.8	4.3	.3	74.2	2.4	1,280
Raisins	10.0	13.1	2.3	3.0	68.5	3.1	1,265
Nuts:							
Almonds	45.0	2.7	11.5	30.2	9.5	1.1	1,515
Brazil nuts	49.6	2.6	8.6	33.7	3.5	2.0	1,485
Butternuts	86.4	.6	3.8	8.3	.5	.4	385
Chestnuts, fresh.....	16.0	3.8	5.2	4.5	35.4	1.1	915
Chestnuts, dried	24.0	.5	8.1	5.3	56.4	1.7	1,385
Cocoanuts	†48.8	7.2	2.9	25.9	14.3	.9	1,295
Cocoanut, prepared .....	.....	3.5	6.3	57.4	31.5	1.3	2,865
Filberts	52.1	1.8	7.5	31.3	6.2	1.1	1,430
Hickory nuts	62.2	1.4	5.8	25.5	4.3	.8	1,145
Pecans, polished	53.2	1.4	5.2	33.3	6.2	.7	1,465
Peanuts	24.5	6.9	19.5	29.1	18.5	1.5	1,775
Pinon (<i>Pinus deulis</i>).....	40.6	2.0	8.7	36.8	10.2	1.7	1,730
Walnuts, black	74.1	.6	7.2	14.6	3.0	.5	730
Walnuts, English	58.1	1.0	6.9	26.6	6.8	.6	1,250
Miscellaneous:							
Chocolate .....	.....	5.9	12.9	48.7	30.3	2.2	5,625
Cocoa, powdered .....	.....	4.6	21.6	28.9	37.7	7.2	2,160
Cereal coffee, infusion (1 part boiled in 20 parts water)† .....	.....	98.2	.2	.....	1.4	.2	30

*Fruits contain a certain proportion of inedible materials, as skin, seeds, etc., which are properly classed as refuse. In some fruits, as oranges and prunes, the amount rejected in eating is practically the same as refuse. In others, as apples and pears, more or less of the edible material is ordinarily rejected with the skin and seeds and other inedible portions. The edible material which is thus thrown away, and should properly be classed with the waste, is here classed with the refuse. The figures for refuse here given represent, as nearly as can be ascertained, the quantities ordinarily rejected.

†Milk and shell.

‡The average of five analyses of cereal coffee grain is: Water, 6.2; protein, 13.3; fat, 3.4; carbohydrates, 72.6; and ash, 4.5 per cent. Only a portion of the nutrients, however, enter into the infusion. The average in the table represents the available nutrients in the beverage. Infusions of genuine coffee and tea like the above contain practically no nutrients.

LESSON 7

OBESITY—CAUSE AND PREVENTION

“Fat paunches have lean pates—and dainty bits make rich the ribs, but bankrupt quite the wits.”—*Shakespeare*.

SUPERFLUOUS adipose (how much better that sounds when applied to ourselves than obesity or corpulence) is really an abnormal development of fatty deposits in cellular tissue, which is constantly accumulating by reason of excessive nutrition. All stimulants and rich foods force the process of assimilation into abnormal action, which results in inactivity of the portal system.

Constipation is another fertile cause of corpulence. And poisons which accumulate in the system from this cause alone interfere seriously with the functions of the heart, liver, kidneys and circulation.

Hippocrates taught that all fatty deposits decrease the size of arteries and veins, thus causing general and persistent disturbances to health. Very few people realize the danger to life itself that lurks in “obscured” physical outlines. In the interior of the body,

also, the organic functions are all impaired or seriously hindered by pressure and weight of fatty deposits, thus causing a disturbance in vital economy by an over-balance of heat in the form of carbon which has accumulated in the system instead of uniting with inspired oxygen and being exhaled from the lungs.

In treating for superfluous flesh, age, sex, past and present conditions should be taken into consideration. A knowledge of temperament is also of vital importance. It is not generally understood in the Occident that certain dieting and drugging have a directly opposite effect on persons of opposite temperaments. A lymphatic temperament can stand fasting well, where, on the same régime, a sanguine-bilious temperament would probably develop serious congestive conditions.

Corpulence is rare among those who breathe deeply, and almost unknown among those who live in high altitudes.

All stout people should avoid soups and liquids at meals, though plenty of pure water, or with a dash of unsweetened lemon or any fruit juice, should be used freely between meals. Nitrogenous foods, which

form the basis of tissue building, should be restricted to one-fifth of the food eaten. All sweets and sugar foods are also fattening. Stout people should eat not more than twice a day. Hunger is a habit, often more sensational than real. After the first few days of deprivation the sense of "all-goneness" so often complained of by those who try to skip a meal is replaced by a sense of bouyancy and endurance.

Gluten bread is excellent in a reducing dietary. So also is hot water early in the morning and at bedtime. All salads and green vegetables and sub-acid fruits may be eaten freely.

By introducing as little carbon as possible into the system in the form of food the body is compelled to use up carbon already stored up in fatty tissues, and so by a *natural absorption* and suitable dieting there is soon a rapid reduction in size and weight.

The writer strongly advises a mixed diet. The greatest danger to health lies in over-eating and in eating too often. The writer also strongly deprecates violent exercise for stout people. Quiet, persistent, rhythmic, physical efforts in energizing not only de-

velop natural lung power and a fine contour, but make a radical change in the health of those predisposed to corpulence.

Fat is about 79 per cent. carbon, and chemistry has long ago taught that oxygen has a special affinity for carbon.

In following any suggestions made in this lesson, readers must study themselves, having regard to the individual rather than common needs.

To the lack of oxygen in the human system can be traced all the minor ills that flesh is heir to. Without its cleansing, vital, energizing qualities life is only half lived.

We dread sickness and death. Fear of those conditions seems to have been firmly implanted in the human mind to inspire more care of "the house we live in." Growing old as the years flit by is a process that science has not yet been able to arrest, but we may all grow old healthfully and gracefully. It rests with ourselves if the depressions and diseases of the physical forces become dominant. It is wiser to recognize them and work for their alleviation rather than to deny their existence.

Physically, circumstances control our en-

vironment to some extent, but *mentally*, we can all choose our dwelling place.

For the self-reliant, the brave, the true, the hopeful, universal energy is equal to every demand that can be made upon it. Old time is ever flying, and it is best to gather all the sweetness we can by the wayside. To get the best we can out of the present is the best preparation for the future.

In health or disease every one should study food in its relation to health and their own powers of digestion. Wait always for a natural inclination for heavy food. Digestion and assimilation have to follow the act of swallowing. We should control our appetites and only swallow what we know we can digest in comfort, assimilate and turn into good blood. In this way the nutrition of the cellular construction of the body is governed with the least resistance.

The nutrition of every part of the body is under direct control of the nerve centers. Certain functions of the nervous system regulate the respiration and circulation, also secretion and excretion, and others act as electrical currents to convey vital force or nervous energy to every fiber of the body.

Every effort, either mental or physical, involves the expenditure of a certain amount of nervous energy, which in normal health can readily be restored from day to day by proper attention to air, food, hygiene and sleep.

It is due to ourselves to keep the heart youthful in its emotions and to aid it physically in its marvelous activity of controlling the blood stream, which is constantly passing through its valves at about the rate of seven miles an hour.

We can readily lessen the strain on the heart by keeping the river of life properly supplied with life principles and to see to it daily that its mysterious channels and by-ways are kept free from accumulating debris. In "the house we live in" can be found a more marvelously perfect system of irrigation, drainage and sewerage than mortal mind has ever dreamed of. In the exhalation of the breath about 30 per cent. waste product is thrown off in the form of poisonous vapor, only about 6 per cent. by the alimentary tract and the balance should be excreted by the skin and kidneys.

We control the creative or destructive qualities of our physical forces by our choice

of thought. No mind is large enough to hold more than one thought at a time. It is now an established fact that *thoughts* and *emotions* create *chemical disturbances* in the human system that can *refresh* or *poison* the blood. *We govern* these processes by our *mental* attitudes.

An acorn has within its little shell a germ of life that if given suitable soil and environment would make it a monarch of the forest.

Every human being has a higher consciousness, to which there are no limitations, but which can be dwarfed in its growth if we submit unnecessarily to the "ills that flesh is heir to."

Men who retire from active business at middle age and indulge too freely in the pleasures of the table always put on superfluous flesh.

An obtrusive abdomen in men is invariably caused by over-activity of the assimilative process, often created by powerful excitants of the digestive organs, such as stimulating drinks and highly seasoned food.

Fat people become indolent and slow of thought and action. The Greeks and Romans always punished soldiers who became too

fat, and by frugal diet, vigorous exercise, and controlled breathing, prevented the accumulation of superfluous flesh in themselves and children.

A Greek historian left on record that the great Dionysius became so dull and idle through corpulency that it sometimes became necessary to prick his skin with needles or cover him with hungry leeches to wake him from his lethargy.

There have always been people who, like Shakespeare's Falstaff, have been "fat and scant o' breath," and in medical history as far back as the days of Hippocrates and Galen one learns that much attention was paid to the cause and cure of corpulence.

We read of Hippocrates advising cold baths (and condemning hot ones), fasting, exercise and unlimited *fresh air*. (Fresh air means plenty of oxygen, which is necessary to burn up the carbon stored away in the tissues of stout people in the form of superfluous fat.)

Galen advised much friction and manipulation of the body and a frequent sponging with vegetable acids.

Physicians of later date suggested breath-

ing gymnastics and great attention to diet, forbidding all farinaceous food. Later still the Banting cure attracted much interest, but that is a system that compels such a radical change of diet and habits that not every one can stand it safely.

During the period of dieting enough food should be eaten to keep up the normal strength.

An occasional Turkish bath is helpful to eliminate the waste products, to be followed with vigorous massage, especially of the abdomen. Many excellent exercises for reducing the size of the abdomen will be found at the end of this book.

All systems of dieting, fasting, bathing, breathing and medicating should be adapted to the patient's temperament, of which too little study is made in the West.

Very hot or very cold baths invigorate some people and kill others.

In dieting for obesity one should avoid fats and carbohydrates. Those who wish to put on flesh should increase the fats and carbohydrates. All starchy foods, all sweets and sugar increase the tendency to fat. Milk is very fattening and should be avoided in the dietary of stout persons.

Water is the best beverage, but for those who must have it, a moderate use of tea, coffee and light wines is permitted, though not advised. (Do not give up any habit abruptly.)

Gluten bread is excellent in a reducing dietary, so also is hot water. Ordinary bread should be baked twice or toasted dry, and moderation in the use of meat be strictly observed. Pastry and puddings must be avoided altogether. All acids and sub-acid fruits, raw or cooked without sugar, may be eaten freely, and all vegetables excepting those that contain sugar and starch. By introducing as little carbon as possible in the form of food the body is reduced to living upon accumulations of carbon already in the system stored up in the tissues in the form of fat. This, by natural absorption, aids in the rapid reduction of size and weight.

White foods are best suited to persons of a sanguineous or bilious temperament, such as veal, white fish, chicken and most of the watery, gelatinous and albuminous substances, while those of a lymphatic temperament may eat all solid animal foods, which for distinction we may class as red foods, such as beef, mutton and game.

LESSON 8

SIMPLIFIED VOICE BUILDING (OF VALUE TO PUBLIC SPEAKERS, TEACHERS AND CHILDREN).

VOICE PICTURES SIMPLIFIED VOICE BUILDING

THE marvelous power provided by Nature for the production of a rightly placed voice (either for speaking or singing) may readily increase vitality for the whole system, or a wrong method of voice cultivation may cause serious disturbance of the nervous system, apart from actual injury to throat and vocal chords.

Absolute control of the breathing muscles is the basis of perfect articulation for speech or song.

The lungs and respiration muscles *control tone*. *Tone* placing is a matter of study and cultivation, which, however, can be simplified to meet a common need.

All tones for speech or vocalization should be brought as far forward in the mouth as possible. The average child has a shrill,

high, nasal voice or a throaty tone, caused by placing the voice too far back in the mouth—about where the sound *ah* comes in voices that have not been cultivated. This defect can at once be overcome if they are taught to *whisper* properly with the lips.

Let the reader *whisper* a sentence or verse of a song. Note where the formation of the words arrange themselves, and then in low tones say the words, keeping the formation of the words in the same place as when *whispering*. Example: Sing the broad *ah-a-a*. With the average child the sound will be wholly in the throat. Let them in the same tone and breath turn the broad *ah* into the sound *oo*, or *who*, and at once the tone will be outside the lips without conscious effort. Then, while still sounding *oo*, turn it into *ah* and the *ah* also will be found to be, *without effort*, well in front of the mouth.

Sounds are produced by the vibration of the vocal chords, which respond to our will, when we wish to emit a sound on a breath, but which allow a constant quiet current of air to and from the lungs without causing sufficient vibration to make sound, unless we control the breath.

Motive power for sound is of course supplied by the lungs, the organs of respiration, which fill the chest cavity. Air reaches the lungs by way of the larynx and trachea, or wind-pipe, which divides into the right and left bronchus. Each bronchus divides into many smaller bronchi, the smallest of them ending in the air cells of the lungs. On the walls of the air cells can be found a marvelous network of capillaries, and in the act of respiration an exchange is set up at this juncture between the blood and the air, the blood throwing off waste matter in the form of carbonic acid gas and renewing its supply of oxygen. This process of exchange is controlled by breathing. In inhalation, the air cells are expanded, and this expansion should affect the chest cavity in all its diameters, lateral, antero-posterior and vertical.

When one remembers that the chest is conical in shape, with its upper end much narrower than its base, it is easy to realize the chest was not designed by Nature for high chest expansion only.

Not only is the clavicular, or upper chest, expansion contrary to natural laws, but Nature's own design of breathing is re-

versed. In taking the high chest breath the shoulders and collar bones are raised, the abdominal muscles are drawn in, the diaphragm is drawn upward, thus crowding the heart and the lower edges of the lungs. This is the most unnatural method of expanding the chest, though even in this advanced era it is being taught. High chest breathing that involves muscular effort is contrary to the natural law of expansion and contraction. Costal breathing is almost as detrimental, both to the voice and general health.

In normal breathing, as Nature designed and finished her handiwork, the chest is increased in all its diameters (vertical, lateral and antero-posterior). This can only be brought about by the proper use of the diaphragm, a dome-shaped muscle that serves as a boundary and divides the chest from the abdominal cavity. In normal breathing the diaphragm takes a rhythmic dip downward with every inspiration. This flattens its arch and largely increases the size of the chest cavity, a wise provision of Nature, giving the lungs room for rhythmic expansion with every inhalation, and by the same movement the downward pressure of the diaphragm gives

continuous involuntary vibration to the stomach, liver, spleen, etc.

In inspiration the lungs fill by inflation as much of the chest cavity as the respiratory muscles will permit. In exhalation the movement of both chest and lungs seem to be automatic and free from muscular effort, unless expired forcibly. Those who wish perfect control of respiratory muscles for health or voice should often practice inspiring very slowly with as little muscular effort as would be used in inhaling the perfume of a favorite flower. In exhaling, puff the cheeks and blow out a tiny stream, controlling it at intervals by holding the breath. Children should be encouraged to whistle and blow bubbles.

In taking breath there should be no apparent effort while using the voice, and there would be no necessary effort if the olfactory nerves have been trained to take their automatic share in the control of respiration.

Rapid increase in physical strength and additional measurement of the chest follow exercises in *breathing controlled by olfactory nerve influence*. This method involves the use of the *costal muscles* (superior and inferior) as well as the *diaphragm*. The ab-

dominal walls should remain passive in speaking or singing excepting for the slight rhythm caused by the vibration of the diaphragm. The experience of the author, covering a period of many years' observation and practical work, indicate that in defective breathing children, after about two weeks' drill in the proper use of the diaphragm, the breathing becomes *natural* and the *chest expansion remains permanent without conscious muscular control*. This enables the lungs to remain fully inflated, merely changing their residual air automatically instead of forcibly. Students must add to this high chest position the art of throwing *weight of body on balls of feet instead of heels in standing and walking, when at once, without conscious effort, the abdomen is flattened, the spinal column straightened and chest remains high, without conscious muscular control*.

For the majority of people in the Western Hemisphere normal breathing has become a lost art, but all healthy normal children are born breathing with full lung inflation, and not until they have had a series of colds and nasal trouble do they become defective breathers.

Breathing muscles rest automatically in correct use of the diaphragm, because with every inspiration resistance is followed by relaxation. During the classic ages control of intervals between inhalation and exhalation was considered of great importance to health and curative power in disease.

In the Upanishads of ancient India one reads, "What is self? It is the understanding of the man between the breaths."

In Dallas' "Chinesiology," Paris, 1857, one reads, "Two thousand years before the Christian era the Chinese understood the healing power of breath and used a very complicated method of breathing, while holding difficult positions of the body, for the treatment of disease."

During the Middle Ages, Galen and other physicians of that period often prescribed "Cohibitio Spiritus" (holding of the breath) for healing of the sick, teaching that such efforts would improve health, expand chest, increase growth, etc.

Plato also had much to say about the healing power of breath.

Control of breath is as necessary in *public speaking* as in singing.

In re-establishing rhythmic breathing (Nature's best gift) we must learn to hasten slowly. He who only half breathes only half lives, and has no real control of his *nerves or voice*. In public speaking or singing one should never use the voice on a *forced breath*. The throat should be free from tension, the diaphragm should be automatic in inhalation and absolutely passive in exhalation. The method of holding the chest in public speaking or singing is similar, except that in speaking for full, deep and sonorous tones the chest should be held a little more firmly at the base. The reader can get the meaning at once by inhaling a long, gentle breath and whispering the letter *e* rather forcibly, but after nostrils and respiratory muscles have been properly trained for inhalation the high, firm chest will remain expanded without effort.

Public speakers, school-teachers and others who have to use their voices continuously get hoarseness, clergymen's throat and often loss of voice, not from *over-use of the vocal chords*, but from *bad management of the breath, cultivating the artificial for the natural*.

Throat muscles, like all others, grow fa-

tigued from use, and when overtaxed become congested and inflamed. This condition is invariably caused by straining, giving the tone too much breath. Tones should not be *forced* out of the throat. They should float out of the lips on a *controlled* breath of air. This means *regulated respiration*, improved physical health and improved general physical conditions. People who use their voices much should pay especial attention to the *hygiene of the nasal passages*. *Catarrhal troubles are evidence of neglected colds*. In ordinary health, when nostril breathing is normal, air will be filtered, warmed, moistened and probably sterilized, before it reaches the bronchi, and the vocal chords will secrete their own lubricant.

The most important point in the hygiene of nostrils is the daily habit of increasing their energy by inspiring on alternate nostrils every morning at an open window as a part of the morning toilet. This at once relieves the lungs of waste matter accumulated during sleep.

Control of the breath is the first essential for public speakers. It is also largely instrumental in the cure of stammering.

The *quality* of vocal sounds depends largely upon the management of the breath. Tone placing in children means the proper use of the voice. The vocal chords are two flexible muscles susceptible of expansion, contraction and vibration. They are situated in the larynx (the sound chamber), which in turn is fitted with a marvelous arrangement of membranes and muscles, all requisite for the articulation of the human voice.

Air may pass through the vocal chords without vibrating them sufficiently to create sound, which readily proves that will power and conscious management of the breath are the cause and effect of tone placing. In training the child's voice for singing, the management of the breath in inspiration and expiration and tone placing is of infinite value in the early stages, because while many children can be taught to inspire slowly, very few have the least idea of controlling the breath in exhalation, and usually expel the breath in a full blast. This could be easily overcome by teaching them to pout the lips and puff the cheeks while they blow and control an even, tiny stream of air. This helps to keep the chest high, the shoulders down,

and soon fills out the hollows at the base of the throat caused by shallow breathing.

To improve the speaking voice children should practice *whispering* frequently, and *gently sounding* labials, *b*, *p*, *m*, and so on. The vowels are all formed in the throat, and when using them for exercises in the child or the adult it is best to prefix the vowels with a labial, such as *mouth*, *me*, *ma*, *beau*, *ba*, *be*, *bi*, *boo*, etc.

Gently hum labial sounds on all tones of the compass. The wrong tone placing of vowels are responsible for impaired vocal chords, strained throat muscles, etc. This is not a singing lesson, but it means very much if every one who has charge of children will do even a little for the children's voices. At their different recitations let them cultivate the ear by listening to and feeling for the sounds that can be created in the resonance chambers of their own heads and faces. Encourage them to play at tone placing. Let them sound the broad *ah*. Let them feel with their fingers the sound vibrated at the base of the throat. Then let them turn the same sound on the same tone into *oo* or *who*, and they will find the tone outside the lips. Let

them practice *a—oo* until *ah* itself can be formed on the lips instead of in the throat. Let them place, without sounding, such words as *please*, *plow*, and so on.

In the song primer by Alys E. Bentley (A. S. Barnes & Co., New York City) will be found some splendid hints for developing tones in apparently "tone deaf" children. Miss Bentley writes:

"The whole question of breathing and phrasing will be generally understood when we train our children to become sensitive to movement in songs as we train them to become sensitive to movement in reading. . . . Do not be thrown off by the technical terms and expressions used by people who do not know just what they are talking about. Trust your own good common sense and feeling for movement. Expression in song is not a strange and unknown thing, but a very simple and direct known thing. Rhythm is not something outside of us that we can only get by watching a wooden stick in the hand of a wooden man. No, it is a real, beating, throbbing thing within the soul and heart of every boy and girl in your school." . . .

"No one object of human pursuit demands

so complete an organic training as music, and were it pursued as a human end, for its effect upon the human person, it could be made a tremendous contribution to organic culture. With this change of motive there would, as in the art world, be a distinct change of method. . . . When vocal music is taught as a human art and not as a contribution to human perfection and not as an end in itself, it will carry on its work along the lines of cause and effect. That is to say, through the interest and spontaneity and affection of the learner. It will be given as an agent to culture to increase the health and poise and sight and hearing and voice and touch. The organic human power of those whose high privilege it is to learn music and to offer them a superb medium for the expression of the profound aspirations of the spirit.”—C. HANFORD HENDERSON, in *“Education and the Larger Life.”*

While modern writers talk about “*over-tones*” and “*color scales*,” etc., a perusal of ancient literature would indicate that history is merely repeating itself, and that King Solomon knew whereof he spoke when he said, “There is nothing new under the sun.” A

geometric scale on next page of voice or sound pictures, will demonstrate what modern discovery is doing with sound. Hindu literature of very ancient date gives us a musical octave of twenty-two intervals, on a basis of seven fundamental tones and an interesting comparative table of vibrations in the musical color scale.

See chapter on Origin of Music.

The highest authorities (Hemholtz and Tyndall) admit that a sound composed of air-waves from the voice will not stir a diaphragm unless in unison with its vibrational number. Here are the words of Hemholtz, which will forever settle this matter :

“The intensity of sympathetic vibration with a semitone difference of pitch is only one-tenth of what it is for a complete unison. . . . Hence, when we hereafter speak of individual parts of the ear vibrating sympathetically with a determinate tone, we mean that they are set into strongest motion by that tone (unison), but so air also set into vibration less strongly by tones of nearly the same pitch, and that this sympathetic vibration is still sensible for the interval of a semitone.”

Galileo seems to have been the first to notice the points of rest and motion in the sounding-board of a musical instrument; but to Chladni is due the whole discovery of the symmetrical forms of the nodal lines in vibrating plates. Certain electrical experiments of Lichtenberg suggested to Chladni the idea of scattering fine sand over the plate or disc, whose motions he wished to examine. If a horizontal plate covered with fine sand is set in vibration, those parts which move upwards and downwards scatter the sand from their neighborhood, while on those parts which undergo no change of position sand will remain. Such points are called nodes; and rows of such points are called nodal lines, which may be either straight or curved, according to circumstances.

If a square piece of glass is held by a suitable clamp at its center, and the middle point of a side is touched, while a bow is drawn across the edge near a corner, the sand is seen to gather together in the form of a cross, dividing the square into four equal squares, like a cross of St. George.

When we take a circular plate of glass, clamped at the middle, and touching one part

Metric table dividing the base of a square in geometric harmony by 2, 3, 4, 5, 6, 7, and 8.

This table numbers the harmonic nodes of a musical string and measures the relative distance between them.

Number and node are identical. The geometric or visible harmony, and the audible harmony existing by the same law.

To illustrate the nodal system, or number in the harmonic scale, I have selected the lower line of the bass cleff to represent the cello G string and give the tone its proper location.

The string, by single vibrations, produces a monotone or musical unit; which is not a harmonic but a pedal tonic.

Next the string is divided into two equal parts by the middle node, giving a unison of two tones from the middle to each end, which is the double tonic, vibrating twice while the pedal tonic vibrates once.

The next number divides the line or string by three, and in a unison of three tones we get the dominant, which vibrates a third more than the double tonic in the same tempo.

Next comes the harmonic fourth, by the string vibrating in four sections, and the vibrations count a fourth more than the dominant in the same tempo. All the following harmonics are subject to the same rule in the numbers that follow each other.

Now this illustration holds good in one unison vibrating once more in time than one unison of the next number below. But when we demonstrate the ultimate relation of number in the open string and the first harmonic, it is one to four; for while the open string vibrates once, the first harmonic vibrates twice in two sections, so the number of vibrations in each section are multiplied by two, and by this rule the actual mathematical relation of the tenth harmonic to the open string, by counting all the vibrations, is one hundred to one.

Next we will take the relation of numbers in Geometric Harmony, which is identical with harmonic nodes. For example:

Draw a straight line.

Now give number 1 to each end of it; then divide it by 2, then by 3, then by 4, then by 5, and put down these numbers where the measurements occur.

You will find the distance between 5 and 4 to be just one-fifth the distance between 1 and 4, or by adding 1 and 4 you get 5, and 5 indicates the ratio of 1 to 4 in the measurements between these numbers.

Each end of the middle fifth lies between 2 and 3, and marks the distance between, in the ratio of 2 to 3.

You also find a tenth of the whole line between 5 and 2, which is their multiple, and between 5 and 3 you find a fifteenth of the whole line, which is one part of their multiple. So much for number five in a musical string, or a straight line. All following numbers are subject to the same rules.

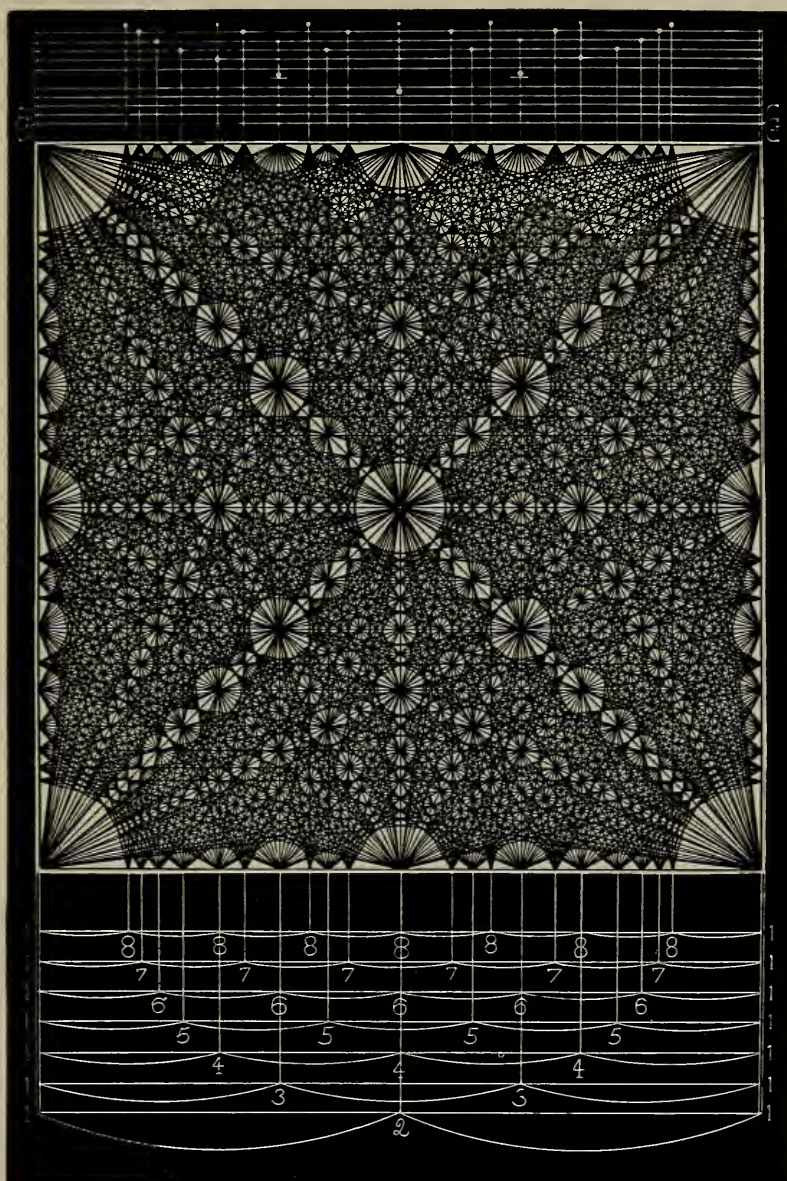
All regular forms and irregular deviations in the above chart show a center of their area, and all the intersections bear a mathematical relation to each other throughout.

Geometric harmony is produced by the kindred values of number in form. It reveals properties in the circle, plane line, triangle and square, that cannot be obtained by mathematics alone.

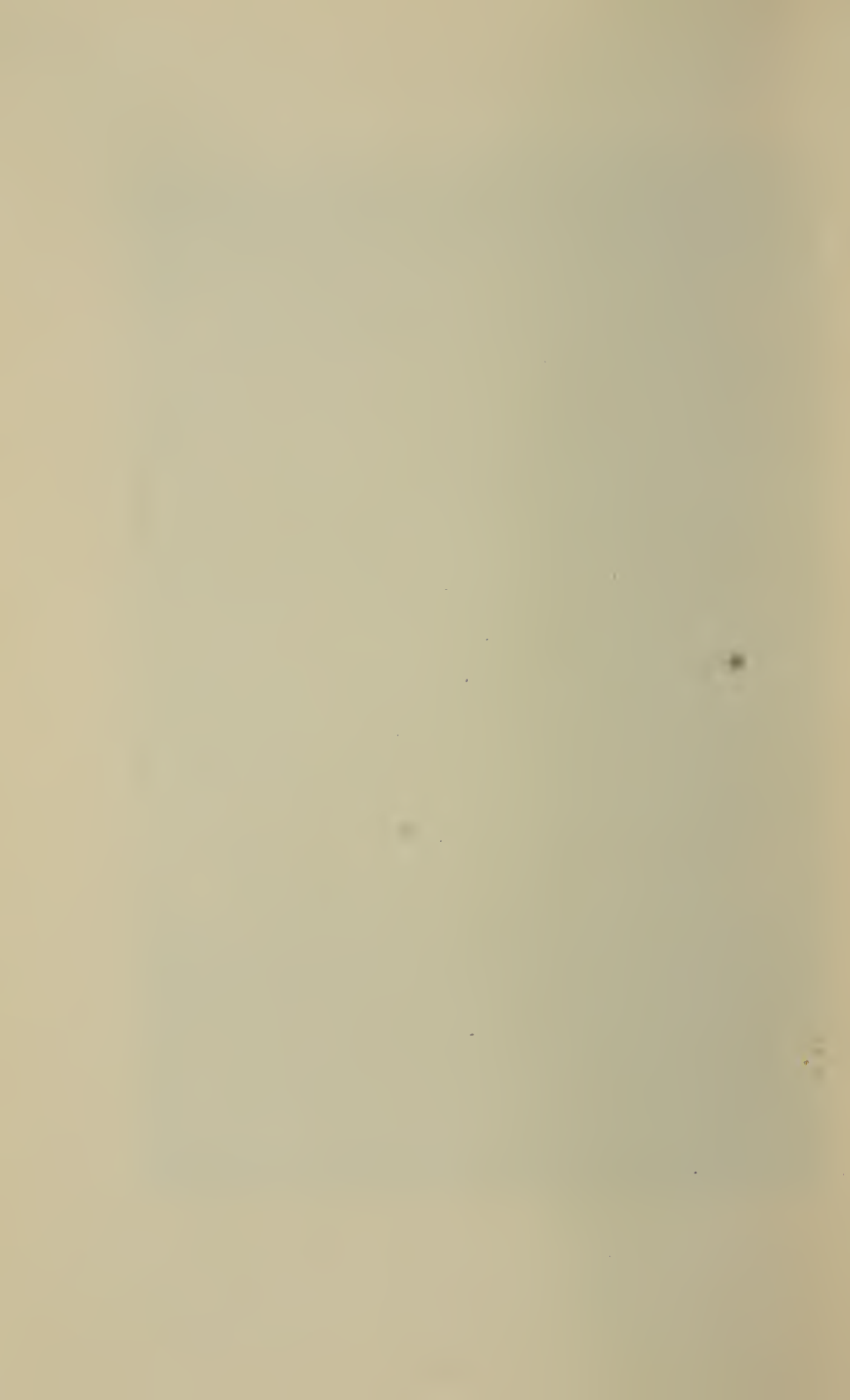
It measures the base of a square by its hypotenuse or diameter. It measures the radiant chord of a circle by its diameter, and gives you a perfect musical scale in harmonic ratios.

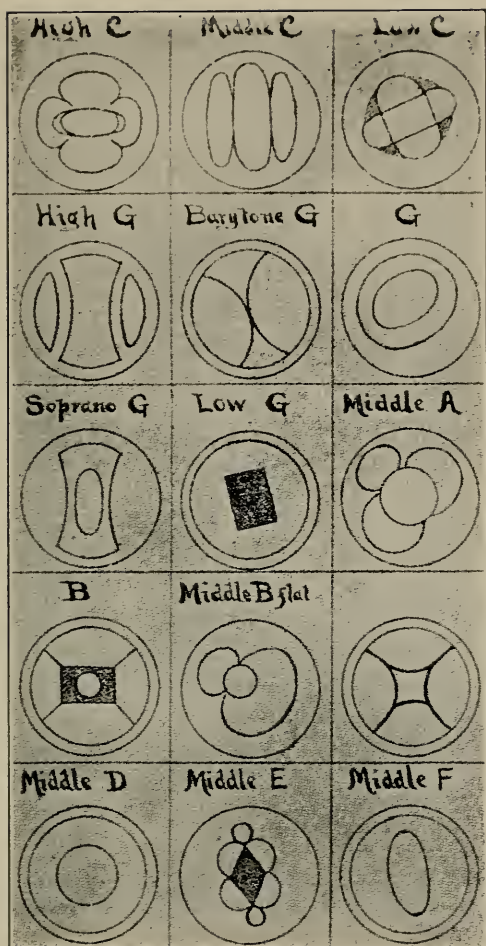
Music is a scientific fact and without the requisite form is just as injurious to the musical ear as deformity is to the artistic eye.

NOTATION OF HARMONIC SCALE TO NO. 8, 'CELLO G.

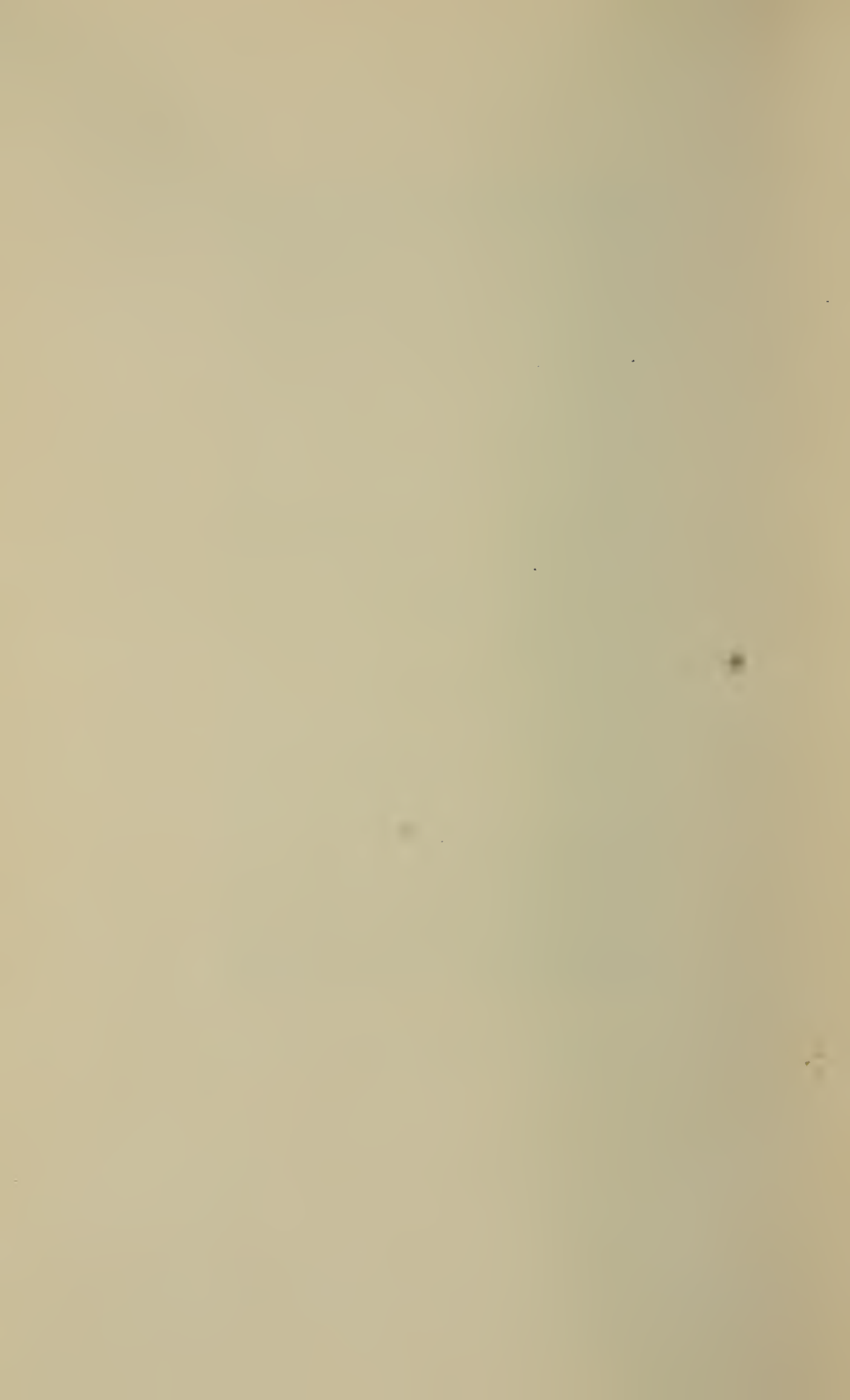


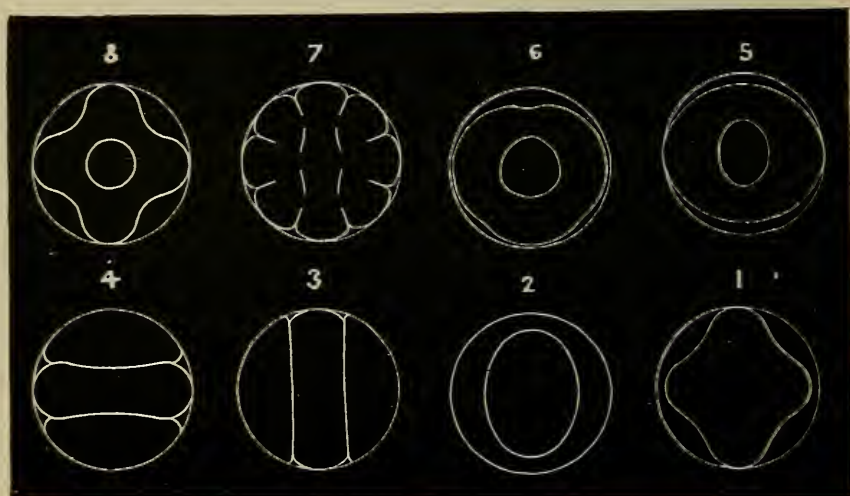
DR. J. MOUNT BLEYER'S AND MELVILLE M. WILSON'S SCALE



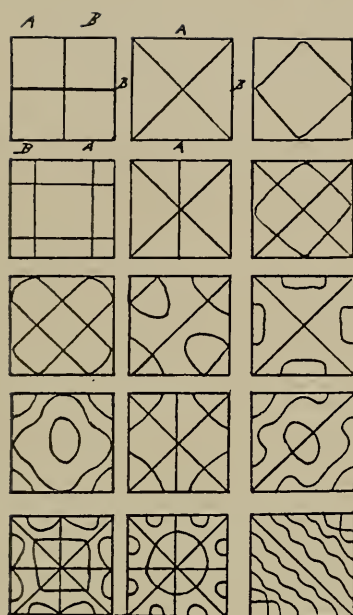


DR. BLEYER'S VOICE FIGURES OF VARIOUS
PITCH





MRS. HUGHES' DIATONIC SCALE
(by permission), from *Voice Pictures*.



CHALDI'S FIGURES

Showing the vibrating surface when sand divides it into squares. The figures marked *A*, *A*, are in different stages of vibration from those marked *B*, *B*.



of its edge with the finger, draw the bow across a point of the edge half a quadrant from the finger, we see the sand arrange itself along two diameters intersecting at right angles. If the bow is drawn at a point one-third of a quadrant from the finger-clamped point, we get a six-pointed star. If the bow is drawn at a fourth of a quadrant from the finger-clamped point, we get an eight-pointed star. And so we can get the sand to arrange itself into a star of any even number of points; that is, we can get a star of four, six, eight, ten, twelve, etc., points, but not of three, five, seven, etc.

A curious effect is produced if very fine powder be strewn along with the sand over the plate, for it is found that the dust gathers, not where the nodes or places of no vibration lie, but where the motion is greatest. Faraday assigns as the cause of this peculiarity the circumstance that "the light powder is entangled by the little whirlwinds of air produced by the vibrations of the plate; it cannot escape from the little cyclones, though the heavier sand particles are readily driven through them; when, therefore, the motion ceases, the light powder settles down in heaps

at the places where the vibration was a maximum." In proof of this theory we have the fact that "in vacua no such effects are produced; all powders, light or heavy, move to the nodal lines."—TYNDALL ON SOUND.

Professor Wheatstone has shown, in a paper read before the Royal Society in 1883, that all Chladni's figures, and, indeed, all the nodal figures of vibrating surfaces, result from very simple nodis of vibration, oscillating isochronously, and superposed upon each other, the resulting figures varying with the component nodes of vibration, the number of the superposition and the angles at which they are superposed. For example, if a square plate be vibrating so as to make the sand arrange itself in straight lines parallel to one side of the plate, and if, in addition to this, such vibration be excited as would have caused the sand to form in lines perpendicular to the first had the plate been at rest, the combined vibrations will make the sand form in hills from corner to corner.

The varieties of vibratory motion to which the diaphragm of the telephone has been made to respond have been multitudinous. Not only have all orders of sound, singly and

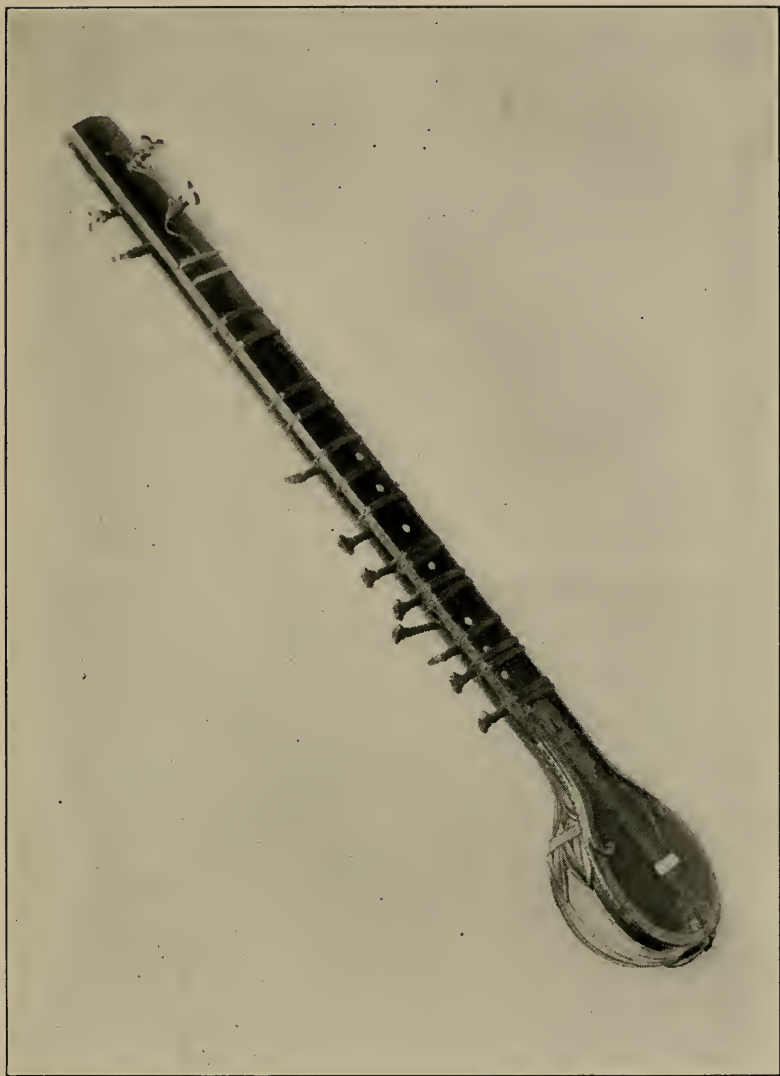
together, been responded to, but vocal sounds which in many respects differ widely from ordinary tones are repeated, and the peculiarities of intonation which distinguish one voice from another have been faithfully reproduced.

We now know that the speaking diaphragm in the telephone, as in the phonograph, must reproduce not only all the varieties of sound-pulses corresponding to vowel sounds, with their intermixtures of the fundamental tone and its over-tones and their inflexions or sliding changes of pitch, but also all the effects produced on the receiving diaphragm by those interruptions, complete or partial, of aerial emission which correspond to the pronunciation of the various consonant sounds. It might certainly have seemed hopeless, from all that had been known or surmised respecting the effects of aerial vibrations on flexible diaphragms, to attempt to make a diaphragm speak artificially—in other words, to make the movements of all parts of it correspond with those of a diaphragm set in vibration by spoken words, etc.—by movements affecting only its central part. It is in the recognition of the possi-

bility of this, or rather in the discovery of the fact that the movements of a minute portion of the middle of a diaphragm regulate the vibratory and other movements of the entire diaphragm, that the great scientific interest of Professor Graham Bell's researches appear to reside.

It was reserved, however, to Thomas A. Edison to show how advantage might be taken of this discovery to make a diaphragm speak, not directly through the action of the movements of a diaphragm affected by spoken words or other sounds, and therefore either simultaneously with these or in such quick succession after them as corresponds with the transmission of their effect along some line of electrical or other communication, but by the mechanical reproduction of similar movements at any subsequent time (within certain limits at present, but probably hereafter with practically unlimited extension as to time).

For voice pictures, geometric scale and data we are indebted to Dr. Bleyer and other distinguished scientific investigators.



THE VINA OF INDIA

(Earliest known stringed instrument)



LESSON 9

THE ORIGIN OF MUSIC—EAST INDIAN TRADITION

TRADITIONS of the music of India have many interesting mythological associations. Many of the Hindu gods and goddesses of mythology are represented not only as patrons of art, but as inventors of musical instruments and composers of music and poetry.

Saraswati, the Hindu Goddess of Music and Speech, is said to have been the first to arrange a system of sounds into a musical scale. She is always pictured as seated on a peacock, holding the Vina, the earliest known stringed instrument (a picture of a Vina of very early date illustrates this chapter).

The consort of Saraswati is depicted in the same scene as a vigorous man keeping time by beating a drum. Vishnu, in his Re-incarnation of Krishna, is depicted in the same scene as a beautiful youth playing on a lute, and Ganesha (symbol of wisdom),

always represented in the guise of an elephant, is in the same group.

Even at this late date all musical ceremonies in India are commenced by playing an ode of praise to the Goddess of Music.

The Rig Veda, the oldest tradition preserved in literary form, contains songs and hymns of praise. The early poets of India were called Rishas, and were held in great esteem and veneration. They sang and recited their own compositions and accompanied them on the Vina.

The musical octave of Indian music is idealized in the form of exquisite nymphs. It is divided into seven parts—division, tone, melody, time, rhythm, harmony and poetry.

The musical scale of India has twenty-two intervals to an octave, always keeping on a basis of seven fundamental tones, and music is written in that country in thirty-six different keys, an interesting reason for which can be found in Hindu mythology. Some of their music is only used at the different seasons of the year, and many songs are arranged to symbolize the moods of the different seasons.

The Hindus call the human voice a gift

from the gods, and claim that one who has full knowledge of the power of the human voice can cultivate more than mortal charm.

They say, too, that a repetition of certain tones of the musical scale can stimulate the mind, awaken the soul and arouse the inborn divinity of man. Also, that musical sounds properly understood would obliterate evil tendencies in the criminal and cure disease and insanity. They know that the highest vibration of sound is color. The writer has seen them prove that much.

One of their traditions recites that a timely use of the rain Raga sung by a woman once saved Bengal from drought, and that as far as the vibration of her voice reached rain fell. That story is still told with the utmost gravity, and millions of Hindus believe it.

All the Ragas are short, but varied by repetition and change of time. Many of their songs are in the minor, and sound like a wailing lamentation. Others are suggestive of Rondos, Fugues and Nocturnes.

The music of the northern provinces differs somewhat from that of the south. The northern music is more martial, and they have much of folk-lore in their poetry.

In the south the music is still closely associated with religion.

The Marga Sangita is the highest order of Indian music, being of (supposedly) sacred origin, and as such is everywhere received with homage and veneration.

The Hindus teach that music evolved from *nada*, meaning sound, and that *nada*, or sound, had its origin in *akasa*, an ethereal vibration which pervades the whole universe, symbolizing the higher or spiritual side of nature. They speak of musical voices as waves of color, and teach that music is a vibratory language of the universe, the mirror of melodies, the sea of emotions, etc. They have an interesting comparative table of vibrations in the musical color scale, and teach that a proper use of meter in poetry and rhythm in music not only enchants the hearing, but should appeal to the judgment and emotions.

Much of the history of India, musical and otherwise, has been taught and handed down from one generation to another in the two monumental Vedic poems called "The Mahabharatta" and "The Ramayana."

The drama of India is of very ancient

date. Long before Europe had evolved any dramatic literature, that of India had passed its zenith.

In the Indian temples girls are still trained in rhythmic movements and gestures of expression, said to be in vibration with the planetary music of the spheres. These girls take part in the temple services, and earn money for the temples in entertainments for the rich, posturing as Nautch girls, etc.

In the museums and temples one finds an infinite variety of stringed instruments. The lower castes content and amuse themselves with trumpets, drums, horns, conch shells, tamboras, fiddles with two strings, and other stringed instruments made by stretching strings over dried gourds or cocoanut shells. The shofar has always been known in India.

To Beethoven, the tone master of the modern world, the music of the Orient was full of beautiful symbolism and rarest inspiration. Upon his writing table it is said he kept a framed inscription from the Egyptian Temple of Sais, which read: "I am that was, that is, that will be. No mortal has lifted my veil." Wagner also is said to have made a

close study of Oriental and Grecian music. There is much of the mythological in his best compositions.

Every Hindu woman is fond of quoting from the Mahabharatta that exquisite history of the conjugal devotion of the chaste heroine Sita, whose love for her husband induced her to follow him into the forests and jungles, to which he was banished for an exile of fourteen years.

The story of her pleading to be permitted to follow him is sublime in its wifely devotion and self-sacrifice.

Sanscrit poetry is so full of dignity and subtle meanings that any English translation robs it of much of its charm. Sita said in part:

A wife must share her husband's fate;

My duty is to follow thee

Wheresoe'er thou goest.

Apart from thee I should not wish to dwell
in heaven itself.

Thou art my king, my guide, my only refuge,
my divinity;

It is my fixed resolve to follow thee

If thou must wander forth through thorny,
trackless forests.

I will go before thee, treading down

The prickly brambles to make smooth thy
path;
Walking before thee I shall feel no weariness.
The forest thorn will seem like silken robe,
Roaming with thee in desert wastes.
A thousand years will be a day
Dwelling with thee; e'en hell itself
Would be a realm of bliss.

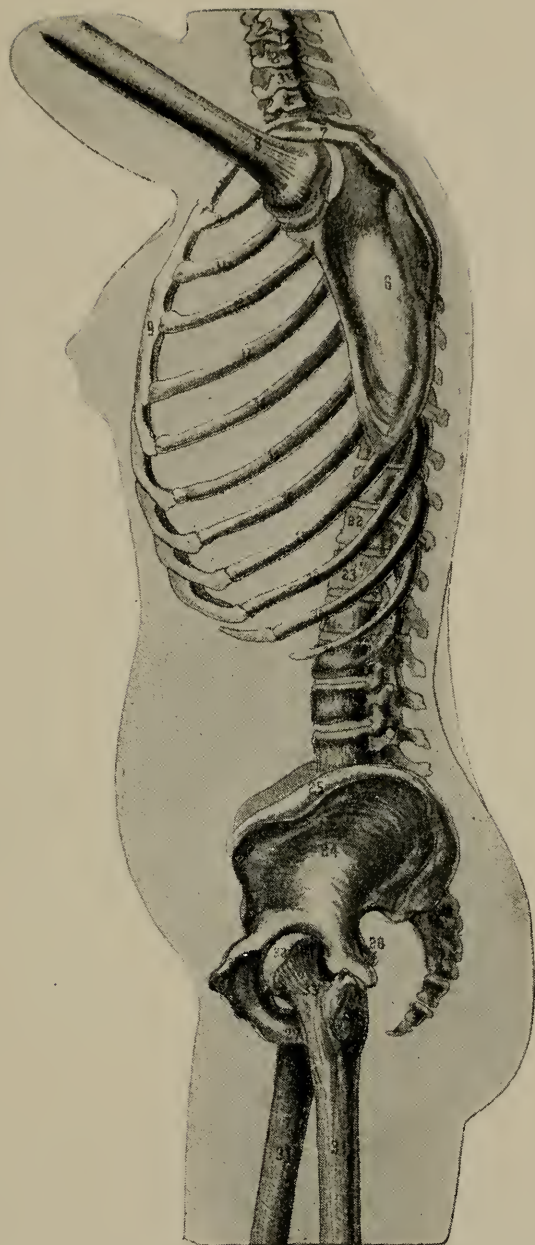
LESSON 10

RHYTHM AND CONTROLLED BREATH THE BASIC PRIN- CIPLE OF MUSCULAR EXERCISE

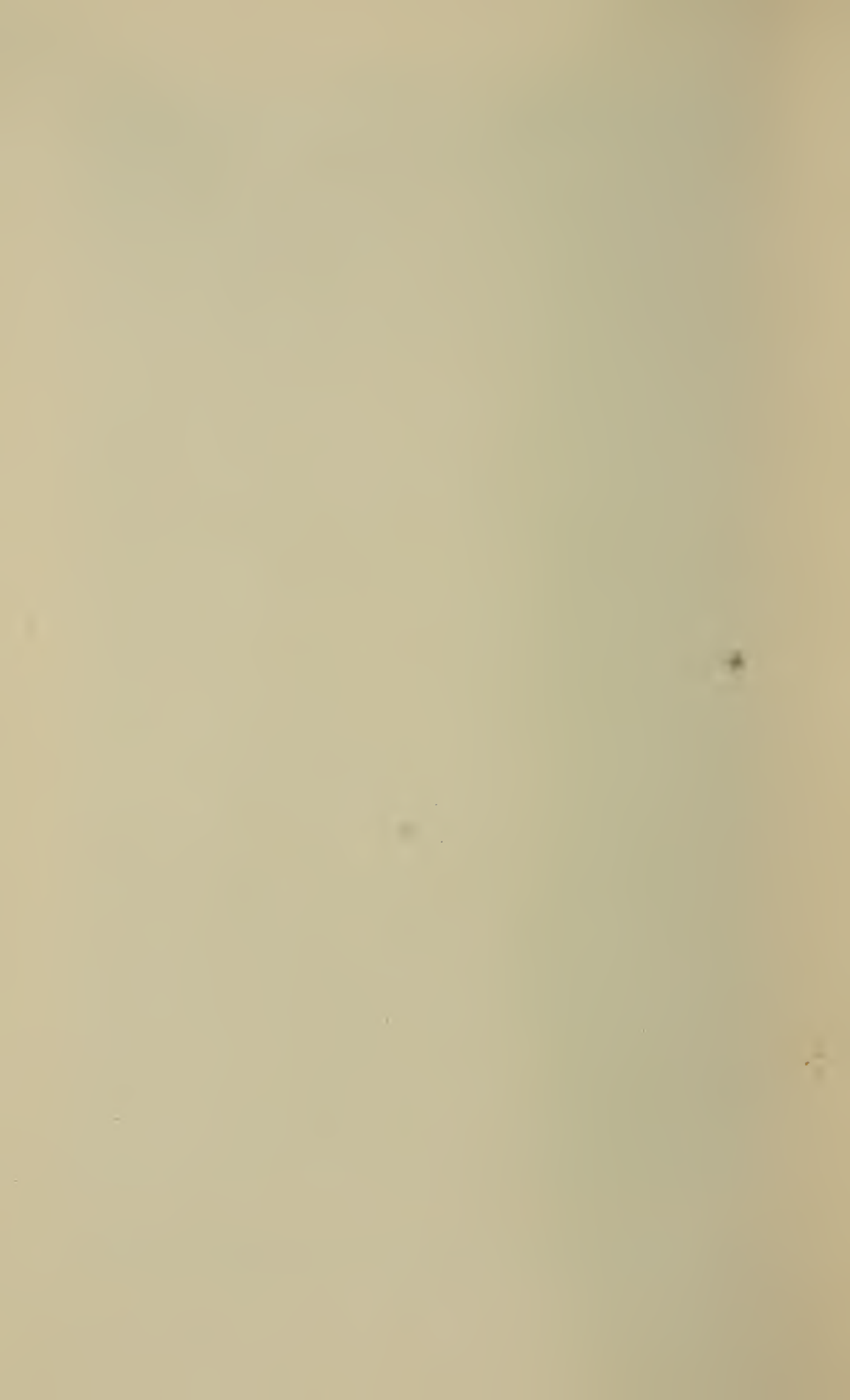
No physical culture exercise that has been, or ever will be invented, can be a substitute for controlled breathing. There can be no lasting benefit from *muscular exercise* unless combined with a knowledge of rhythmic breath, *energizing* and *relaxing*. Exercise should be *daily, but brief*. Then, because of *brevity*, there will at all times be left to the student a sense of *exhilaration* and *renewed energy* instead of *fatigue*. *Breath* is the *basic principle* of all physical energy, and the only exercise which naturally and subconsciously involves the whole body. Among the first lessons given to children of the Orient is that of cultivating the *control of muscular effort by breath*. Fortunately for the rising generation of the United States, some of the most brilliant writers and teachers of the present day are devoting much



Hold elbow in this position, control breath, and sway body in all directions, with alternate arms and then both elbows raised, excellent for graceful contours.



Note the marvelous provision of Nature in the attachment of the ribs to the breast-bone, each with its own little strip of cartilage, to admit of expansion when lungs inflate. Note also how easily the lower ribs may be permanently injured in the young girl by tight-lacing.



earnest effort to the need of better lung development for children, and to this end are advocating the importance of play in school hours and games and sports for outdoor pastimes.

'Tis sad, alas! that thousands of children in overcrowded cities hardly know the meaning of play, or the sight of green fields, wild flowers and blue skies.

All children should be taught games that involve some reaching exercises—to reach high for an imaginary trifle, first with one arm, then with the other, then with both. If this exercise is done on a controlled, gentle breath (the breath to be controlled rather than held) it involves far more possibilities for better lung development than violent muscular chest expansion. All young children and young animals stretch their muscles as soon as they are awakened from sleep. This is a good exercise to keep up in adult life.

Slow movements under high nerve tension while *controlling*, not *holding*, the breath, with diaphragm not drawn up, but allowed to take its normal position and dip rhythmically with every breath, will expand with-

out muscular effort all the chest diameters simultaneously. It is not natural for the chest walls to flatten or collapse after exhalation. *The diaphragm is Nature's rheostat.* As designed by Nature, its normal rhythm covers a double function—that of aiding the respiratory muscles and at the same time vibrating the contents of the abdominal cavity.

The breathing gymnastic exercises sometimes advocated of drawing in and upward the abdominal walls is reversing Nature's method and quite injurious if long continued. *All voluntary abdominal muscular movement is contrary to Nature; short, jerky movements of any part of the body involve a useless expenditure of nerve energy.* Violent effort in muscular exercise is no more necessary in man than it is in the lower animals, who in their wild state spend a great deal of their time in stretching and relaxing their muscles, making only continuous effort when necessary to hunt food, fight their foes or escape danger, and yet among wild animals, *physical efficiency is the rule rather than the exception.* Every one should cultivate the art, of avoiding friction by moving

along the lines of least resistance. Take time to stretch the arms and limbs. Stretch on a full breath. Then gently change on a controlled breath the residual air of the lungs. Stand by the open window for this, inhale and exhale a few times *slowly*, giving the nostrils time to *warm the fresh air* on its way to the lungs. *Alternate the nostrils* in the first breathing exercises of the early morning, not because it is an occult or "Yogi" method, but because it is the best way of energizing the nasal chamber, respiratory tract, and arousing circulation of the blood stream. Catarrh and ordinary colds are almost impossible among those who take the time and trouble to breathe correctly and energize the nasal passages daily. *Exercise through rhythmic breath control has a marvelous effect in the prevention of disease and its cure; additional oxygen in the blood increases the metabolism of the cellular construction of the body, renews the activities of the process of elimination and harmonizes the disturbances that nerve centers always exhibit when breathing is shallow and the circulation sluggish or impaired.*

See cut of standing in correct position.

In the physical development of children correct standing, sitting and walking are important factors. *All mouth breathing children stand and walk incorrectly.*

In rhythmic breath, when not supplanted by artificial methods, but allowed to work as Nature designed it, we have a vital principle which governs automatically all the activities of the body. Bulgy biceps and over-developed chest are often acquired at the expense of permanent health. Many athletes die young.

Rhythm is a natural law.

It is the law of expansion and contraction, which controls the universe and all that therein is.

Laboring men who swing heavy implements and sailors who pull together on heavy ropes fall naturally into rhythm, using the full breath for the moment of supreme effort, then relaxing for the next full breath.

The Japanese understand the power of the full breath in their wonderful feats of wrestling and lifting heavy weights.

The bearers or men who carry human freight in canvas chairs up the slopes of the



RHYTHM

Himalayan Mountains all walk or run in rhythm, chanting little rhymes as they run, improvising as they sing them little commentaries on their burdens, often none too complimentary.

RHYTHM

From the tiniest atom to the greatest, everything is in a state of rhythm or vibration. Natural rhythm keeps the molecules of the body in constant vibration. Rhythm pervades the universe, the swing of the planets around the sun, the rise and fall of the tides. Rhythm is a fundamental principle in human life. There is rhythm in the measured pulsation of the human heart. All motion is a manifestation of the law of rhythm. It has been said that the repetition of a rhythmic note on a violin will start vibrations that would in time break down a bridge. It is for this reason that when regiments of soldiers cross bridges the order is always given to break step, lest the rhythm of marching may bring about some injury to the structure.

Rhythm is the fundamental principle of dancing, although dancing is the most prim-

itive of all the arts. Even the rudest savages practice it, making it a part of their religious observances in tribal festivals. The seasons of the year, the harvests, births, deaths and marriages, every event of tribal importance is celebrated by dancing. Recently in one of the Samoan Islands (not yet civilized) the writer saw a number of women do a muscle dance while sitting down, the men of the tribe making music or rhythm by beating time with their hands.

There are records of dancing two thousand years B. C., and it is commonly supposed that the art originated in ancient Egypt. In India, posturing and expressive gesture, which governs all the movements of the body, is the main feature of the dance of the Nautch girls.

Dancing should be taught to all children, especially the poetry of motion and control of muscles involved in *slow posturing*. The stealthy movements of the shadow dance calls for the most perfect control of the muscles. It is best to practice in front of a mirror as an incentive to graceful poise and perseverance.

A few gymnastic appliances are helpful,

though not necessary, in contour building, such as a punching bag for outdoor use, a bar and ropes to skip or pull upon. Games of fencing, tennis, etc., are excellent for reducing adipose and restoring youthful contours in either sex. After exercises that induce perspiration, a shower bath is of infinite value. For those who have no shower, a rubber tube and spray attached to the bath faucet or even a garden watering pot with spray will answer just as well, *but*, while the body is still moist with perspiration it is quite *injurious to spray with cold water*. One should begin the spray with quite hot water, gradually cooling until nearly or quite cold. Rubbing dry with a coarse towel helps to bring about a splendid reaction.

Children cannot grow up without physical ailments, and defective contours, unless taught to carry themselves properly during the growing period. Parents and teachers do not realize that good health and a fine physique is of far more importance than high markings in school studies. When children breathe correctly, it will no longer be necessary to constantly remind them to keep the shoulders back. *The muscles of the torso*

become so strong through automatic rhythm of correct breathing that the chest walls take care of themselves. When the school term opened in this country for 1908, the number of defective breathers among children of all grades was simply appalling.

Children will get a high chest development more easily if they are taught to do blowing exercises while lying flat upon their backs. *This teaches an easy control of breath.* Even an adult who has apparently finished his growth can add a two- or three-inch permanent expansion to a flat chest within three months' time if he will practice a controlled breath while in the recumbent position for not more than ten minutes every day.

Apart from permanent results for chest expansion, the controlled breath has a wonderfully revitalizing effect on the system. In this system of health exercises one must learn to "*hasten slowly.*" To get best results it is necessary that all movements should be *very slow and on the breath.* (*Controlling is not the act of holding the breath.*)

While exercising, hold every muscle at its highest tension. Consciously energizing the

muscles and rousing the circulation will put more vim and health into persons of sedentary occupation than the most vigorous gymnastics or horseback exercises. Not every one owns a horse, or knows how to ride. Avoid over-fatigue; relax often. Rightly done through control of breath, relaxation enables one to unlock all the muscular tension of the whole system. Over-fatigue obscures even the most charming personality. To be well fed it is not necessary to be overfed. Constipation is greatly aided by *bulk* in food—"roughage" it has been called by a great thinker. There is a breath exercise done in the recumbent position very like the panting of a dog that is especially useful in overcoming constipation.

A few simple exercises for strengthening the muscles of the eyes may not be out of place here. Eyes have to adapt themselves to distances, and every time the eye turns in any direction it is controlled by muscles that perform all the mechanical part of turning the eyeball.

To strengthen the muscles of the eye, hold any small object or a pencil between the fingers. Extend the arm straight out as far

as possible, keeping the gaze riveted on the object. Bring the arm in gradually without removing the sight from the object until within six inches of the eyes. Repeat several times. Carry up and down and from side to side, always keeping the eyes firmly fixed on the object that is being moved.

Stand or sit with the neck muscles perfectly passive, the head in one position; slowly roll the eyes upward and downward and sideways without moving the head. Then keep the eyes on one object and slowly turn the head from side to side and up and down. This will be found to strengthen the eye muscles very materially.

The eyes should always be bathed at bedtime with warm water, and in wiping them rub toward the nose. The eyes should not be used for close work when the body is fatigued, and when using the eyes in a strong light the light should come from behind.

For those out of health many resistance exercises can be accomplished in bed while controlling breath.

LESSON 11

CONTOUR CULTURE—CONCENTRATION AND RELAXATION

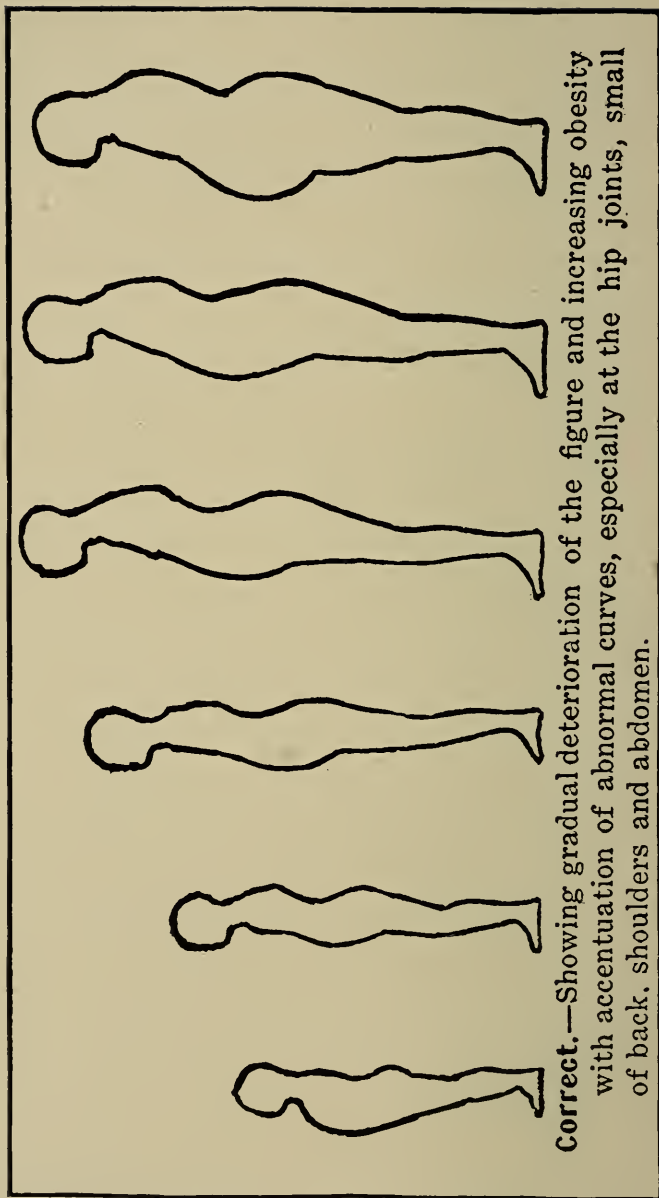
Just as sunlight is inseparable from color, so is beauty of expression and contour of form the most subtle manifestation of perfect physical and mental equipose.

Many women are imbued with the idea that deep breathing means a large waist, sloppy figure, low-heeled shoes and no corsets. We do not advocate low-heeled shoes for feet that are naturally arched, and we believe a well-fitting corset to be an improvement rather than a detriment to the form of a grown woman. In this day and age harmony of outlines in both sexes makes for success in the business and professional world and counts for much in all ranks of life. Just so soon as a woman allows her muscles to relax and fat to accumulate she is qualifying for the Mother Hubbard style of dressing, of all costumes and of all ages the least attractive.

Of course, women who wear corsets

should owe it to themselves to wear only those that fit well and be careful to allow sufficient room at the belt line for proper expansion and balance of the body, but aside from any support, real or imaginary, the corset may be, the chest should never be allowed to flatten or sink downward, as that position at once crowds every internal organ out of position and throws the whole body out of proper contour.

Rhythmic breathing compels the chest to remain high, and the ribs to remain expanded through the full and automatic inflation of the lungs. A strong muscular development of the torso is the first development of rhythmic breath. The illustration accompanying this chapter shows the right and wrong method of standing and the effect the downward droop of chest has upon the contour of the body, apart from its interference with the circulation and the cutting off of its natural supply of oxygen. Among the lessons at the end of this book readers will find some scientific but *simple, practical and non-fatiguing exercises for reducing the waist line if it averages too many inches for type, age and height.*



A thick waist in either sex is invariably caused by accumulation of adipose in the form of stored-away carbon, of which fat is about 75 per cent.

Muscles loaded down with superfluous fat soon lose their suppleness and graceful contour. Superfluous flesh has been rightly called "obscurity," obscuring as it does in the abnormally stout person all the original outlines.

Pressure caused by fatty deposits on capillaries, veins and arteries is often the cause of poor circulation.

Heart disease is frequently merely a symptom expressing the incapacity of the circulation to force its life fluid into veins and arteries that are reduced in size from external pressure.

Any dress or corset that allows the abdomen to press downward and outward in sitting and standing is wrongly made. It prevents the proper rhythm of the diaphragm, interferes with the digestion and imperils the health. We would suggest that students reduce the waist line (where desirable) by proper exercises instead of tight lacing. Any bandage or lacing that tightens the garments

at the pit of the stomach show a lack of common sense; how few of us stop to realize that just back of the waist line lies the solar *plexus*, the sun center, an important nerve plexus that is beginning to be recognized as the abdominal brain, because of its marvelously important function and its relation to the sympathetic nervous system. A very few minutes every morning and evening devoted to rhythmic contour culture would soon establish the habit that would make for health and beauty.

Thanks to the microscope, we know accurately now that the whole process of life in body building is cellular. *By intelligent care of the "house we live in" we can aid and even direct and govern the constructive process of renewing vital energy.*

Many of the ailments so common in school children are due to defective breathing.

Mal-nutrition (where children have enough of suitable food to eat) is invariably caused by defective respiration and, alas! sad but true, in the most magnificently equipped schools in the world—those of the United States—there can be found millions of shallow or defective breathing children

suffering untold misery, many of them from diseases caused entirely from lack of knowledge on the part of their parents and teachers of the natural law of breathing with which Nature endowed every child, whether born prince or pauper, and which should have been kept up in nurseries and kindergartens.

Many people fuss and worry about increase of weight, and do little else to prevent it. One of the best possible exercises for rapidly reducing an abnormal waist line is this: Poise lightly on balls of feet, with mental impulse of starting to run or skate, arms hanging loosely, chest up, chin drawn back. Then walk lightly about the room, drawing each knee alternately up to the waist line, holding it there with clasped hands as long as one breath can be comfortably sustained without chest effort. Do this for ten minutes while undressed night and morning. See illustration.

Another equally useful exercise for reducing waist line: Stand firmly on feet, bend body from the hips and sway in every direction without losing balance. See illustration.

According to the perfect figure of woman, the breadth of measurement of shoulders

and hips should be exactly the same. The waist ten inches less.

In the Orient every one is taught to be respectful to even the most loathsomely diseased, in recognition of the God-atom in man—the vital spark—which constitutes human life. The mystery of life is an all-absorbing one. Students of this system should watch the various functions of their own bodies. Note what happens to the circulation, nerves and muscles when certain movements are brought into play. Study temperament, individuality, and build up to its highest expression of vital kinship with the universe.

People out of health and those desiring to conserve their vital energy should retire early, and leave their beds not later than seven in the morning. Those who sleep late in the morning lack nervous energy. Daily attention to the hygiene of the skin is an exercise of vital importance. Auto-Massage is more beneficial than mechanical or that done by another person. Always massage the skin of the whole body with cocoa butter or oil before bathing. This gives nutrition as well as stimulation to all the nerve terminals, tissues and blood vessels in and beneath the

skin and keeps alert, the myriad avenues of intercommunication between the skin and other functions of the body.

CONCENTRATION AND RELAXATION

In the Orient there is only one meaning for the term "concentration," which is, that *concentration becomes realization through repetition*.

In India it is still customary for the Master to impart knowledge to the student in parables, and to explain the meaning of concentration the following parable was told to the author.

"It is common in India when men desire to join a brotherhood for retreat from the world and the cultivation of the religious side of their nature to be accepted on a three years' probation. Education and caste is of no importance. If a man has worldly goods he usually makes a gift to the temple on his admission to the brotherhood. On this occasion the man was of the agricultural class, alone in the world, nothing left of worldly possessions excepting an old cow, which he took with him as his gift to the temple. The day after arrival, his Master

asked him if he knew the meaning of concentration. He replied, 'I am illiterate, and the word has no meaning for me.' Then said the Master, 'Have you no ideal, no high attribute, upon which you could concentrate?' The man replied, 'I know so little of these higher things, but I know a great deal about my old cow.' Then said the Master, 'How much do you know about your old cow?' Said the man, 'I raised that cow from a little calf. *I know all there is to know* about that old cow.' 'Very well,' said the Master, 'tell me what you know of the cow.' The man replied, 'The cow has a body, four legs, four feet, a head and a tail; it has two horns, two ears, two eyes, four eyelids, two nostrils, a mouth, two lips, a tongue and so many teeth. Its weight is about so much, and its color is brown with white spots.' 'Well,' said the Master, 'so far, so good, as regards general appearance. Now for detail. How many lashes upon one eyelid has the cow?' Ans., 'I don't know.' 'What is the exact color of its eyes?' Ans., 'I don't know.' 'How many hairs upon the tip of one ear?' Reply, 'I don't know.' 'How many hairs upon the extreme end of its tail?'

Reply, 'I don't know.' 'The relative size of the white and brown spots of its hide?' Reply, 'I don't know.' And for every question that the man could answer there were a hundred that he could not. 'Very well, then,' said the Master, 'you may take your cow as a subject for concentration,' which the man did.

"For many moons the man kept up, *through concentration*, his daily study of the cow, until one day, when the Master came to visit his cell, *realization had awakened*, and the man knew all about the cow.

" 'Now,' said the Master, '*through repetition, concentration has become realization*, and you may leave your cell.' 'But,' said the man, 'I cannot get out. I have become the cow.' "

This story is not to be understood from a literal standpoint, but the moral intended to be conveyed, is, that we chose our own plane for *concentration*, and if, *through repetition*, we *remain on that plane long enough*, we shall come into *realization* of whatever we *concentrate* upon.

Because the man in the story had no *higher ideal* than the cow, he remained on the *animal plane*. The story also conveys the lesson that *true knowledge is not superficial*.

Relaxation, as understood in the Orient, is a question of *controlled breathing*. It can only be done in the recumbent position. This is so common in the Orient that on long marches soldiers relax instead of sleep. The nearest approach to real rest is to lie flat upon the back, on the floor or other unyielding surface, and breathe rhythmically (*remember, rhythm is equal motion*), the *exhalation* must be controlled and be equal in time to the *inhalation*. Spread arms and legs to a comfortable angle, and turn the head to one side to relieve tension on neck muscles. (The easy angles of arms and legs take tension off the bone sockets.) Hold pleasant thoughts while resting rather than the strain of counting breaths. On the subject of *conscious relaxation as a substitute for hypnosis*, the writer invites correspondence from physicians, ministers, and others who practice suggestive therapeutics, and refers them to a lesson-brochure on the subject called "Conscious Relaxation an Effectual Substitute for Hypnosis in Psycho-Therapy"—supplementary to "A Method for the Millions." (Direct from Publisher, R. B. Noble, Huntington Chambers, Boston, Mass.)

LESSON 12

FIRST AID TO LONGEVITY

MEN and women age fast when they submit to monotony. At middle age both men and women should forget their birthdays and in the joy of wholly living play the great game of life as if they were winning every move.

Growing old is symbolic of decay, and its ugliness is largely induced by auto-suggestion. Among the lower animals it is difficult, excepting by close observation, to distinguish the old from the young.

In the marvelous economy of Nature's great laws the physiological condition of human life has three important periods. The youth, or glorious morning of life; the high noon, or full maturity of life in both sexes; and the afternoon, which fades slowly but surely into eventide.

In the afternoon of life Nature has reached and passed its climacteric, a period when some of Nature's most potent forces have come to a full stop and must submit to a re-

distribution of electro-chemic energy—a marvelous readjustment of physical conditions in both sexes.

At this period, with proper care of the body, it is possible to develop latent qualities that by recognition and cultivation would make the afternoon of life one long Indian summer.

At this important cross-road of life men and women should make every effort to conserve instead of scatter life's energies. In the afternoon of life it is easy by a close attention to the laws of health and hygiene to *ripen slowly* and not to arrive at the full realization of latent power and talent until quite late in life.

Goldsmith's "History of England" says Plutarch left on record, that the ancient Britons only began to grow old when they had passed the century mark, because of their strict adherence to the laws of temperance in all things. To-day, in Southern India, among the high castes (who eat only twice a day) it is not unusual to find four or five generations under one roof! Among the nations that believe in reincarnation there is absolutely no fear of death. They

rejoice for those who pass on early, and often await with pleasant expectancy the open portal for themselves.

Not so with the (so-called) civilized races, with whom the very name of death is associated with dread and fear. Health cannot long be preserved by the idle, or those of sedentary habit who live too much within the four walls of a house or office. Among the Arabs there is an old saying, "He who builds him a house of stone should at the same time prepare himself a tomb."

At fifty years of age, if self-control has been established earlier, there will be no shattered nerves, impaired circulation, sagging muscles and faltering footsteps and none of the hideous wrinkles caused by pain, worry and discontent.

We build our own individuality, but when we permit the little frictions which are inseparable from human life to worry and annoy us, it throws us off our mental and physical balance and limits our possibilities of daily achievement.

It is well to cultivate toleration of other people's failings. Learn to forget as well as forgive, and hold on to the life-buoy of

optimism, even though our frail bark swamps in the turmoil and troubled surf of unrealized ambitions, and to begin a new struggle with chance, if necessary, rejoicing in the fact that many of the greatest men and women of all ages and nationalities have made *their greatest successes late in life*.

There is no royal road to old age, but tenacity of life is greatly aided by correct breathing and strict attention to diet and hygiene in youth and middle age.

No one can turn back the shadow on the dial of time, but it is possible to grow old healthfully and with some semblance of our original contours.

We select our food, and can control to some extent the process of body building, and it rests largely with ourselves whether we permit our joints to become deformed by the accumulation of uric acid deposits and our muscular outlines to become obscured by superfluous fat.

“One-fourth of all a man eats sustains him, the rest he retains at his peril.”—DR. ABERNETHY.

As an aid to longevity, the Orientals have a fixed habit of early rising, and after bath-

ing and rubbing down the body with oil (to keep the skin smooth and joints supple), they spend special time in rhythmic breathing for the purpose of energizing the nasal and respiratory tract, taking especial care to fully change and empty the lungs of residual air by gently blowing, and to recharge them slowly with the health-laden oxygen of the sun-charged early morning atmosphere.

The Orientals (better than other races) understand the value of exposing *the skin of the body to fresh air*. They have always known the skin has an absorbent and respiratory function as well as the function of elimination.

Octogenarians of the Orient could easily pass for men of fifty years, and careful investigation has proved that they rarely exhibit in middle life any symptom of sclerosis of the arteries, so common in men of the Western Hemisphere, *where normal breathing has become a lost art, and where physicians have lost sight of the fact that a rhythmic use of the diaphragm, adjusts or prevents high blood pressure, by controlling the circulation of the blood stream, arousing,*

as it does, the electro-chemic function of the blood to eliminate the deposits which cause arterial degeneration.

Metchnikoff, in his recent publications, has submitted the problems of life and death to the closest investigation. He argues that death from any cause aside from old age is accidental rather than inevitable, and that senile debility before extreme old age is contrary to Nature.

El Cornaro, of Padua, an Italian champion of old age, lived to be one hundred and two and died without pain. He wrote books in his eightieth and up to ninety-eighth year of age, which during the past three and a half centuries have been translated into many languages. The following is an extract from one of his books, written in his ninety-eighth year :

“The sensual are so entirely devoted to the gratification of their taste and appetite that they hold it is better to live through several years less, or even enjoy the pleasures of sin for a season, than to be put to the torment of laying a restraint upon their appetites. Foolish men; they little think of what importance ten years of life are to a man, more especially at that adult period of

an healthful life, wherein it is in its highest pitch of perfection, and the understanding, wisdom and every kind of virtue are most vigorous. . . .

“. . . Eat and drink what is wholesome and avoid overfeeding. He that is wise enough to observe this will suffer little from other inconveniences. The diseases of repletion infallibly destroy the best natural capacities.”

Among the prominent women of the twentieth century interested in the question of longevity may be mentioned Mrs. Russell Sage, who has founded and endowed an institute for the scientific study and prevention of organic changes that produce old age.

Many of the best-known men and women of all ages have done their *best work after middle age*. In all branches of poetry, music, art, science, invention, discoveries, politics and statesmanship. Recently one of the most exquisite verses ever inspired by woman was written by a man no longer young in praise of the youthful femininity of a long past middle-aged actress *à propos* of her portrayal of a part in Irving's *Charles I.*;

“In the lone tent, waiting for victory,
She stands, with eyes marred by the mists of
 pain,
Like some wan lily overdrenched with rain;
The clamorous clang of arms, the ensan-
 guined sky,
War’s ruin and the wreck of chivalry,
To her proud soul no common fear can
 bring;
Bravely she tarrieth for her lord, the king,
Her soul aflame with passionate ecstasy.
O Hair of Gold! O Crimson Lips! O Face!
Made for the luring and the love of man!
With thee I do forget the toil and stress,
The loveless road that knows no resting place.
Time’s straitened pulse, the soul’s dread
 weariness,
My freedom and my life republican!”

Recently Senator Chauncey Depew, in an after-dinner speech given on his seventy-fourth birthday, said in part: “The first sixteen years of life is a formative period, when muscles and brawn are strengthened for after wear and tear, and the mind is developing careers in dreamland, and ideals are vague. The next sixteen are devoted to making a proper start, and having placed our feet on the bottom rung of the ladder, to demonstrate how far and how quickly we

can climb. The next sixteen, if we have made a mistake and found, as Lincoln expressed it, 'that we are square pegs trying to get into round holes,' we go back and try it all over again, having lost everything but experience. The rest of life we are busy making provisions for old age and securing our proper place with our professions, our business, our church and our parties, but when a man passes seventy no question interests him so much as longevity, and when he passes eighty the subject is still more absorbing." In the course of his speech Mr. Depew dated his freedom from almost chronic rheumatism from the day he stopped eating flesh and confined himself to a simple diet. "Sleep, digestion and clarified vision, such as I had never known before, have kept increasing as I dismiss flesh and fowl for vegetables," he said. With nine-tenths of the world the greatest happiness in life is the table, piled with the things one loves to eat and drink and the pleasures of a gorge. "But for that," the Senator concluded, "the hospital and the graveyard would be largely out of business."

A propos of overeating, Dr. Abernethy

said: "There is no beast of burden in the world so overloaded as the human stomach." As first aid to longevity we add a few suggestions to the reader. First and *most important*, do not break up long-established habits, of smoking, eating, and drinking, too abruptly. Cultivate moderation in all things, *but avoid fads*. It is wise to select a dietary, simple, but suited to our own individual needs and a personal hygiene suited to individual temperament. Occasional exposure of the whole body to direct rays of sunlight, or electric arc-light, is a stimulus to metabolism and increases resistance to disease.

Alcohol is always detrimental to the average power of digestion; so also is very strong tea and coffee. The fundamental first aid to longevity lies in keeping up our birthright of rhythmic breathing, a physical rhythm designed by Nature to keep the pulsation of the human heart in tune with the eternal law of expansion and contraction that governs the universe. There is a chemistry of life—there is also a chemistry of death—in the unchangeable laws of Nature, the harvest and the sickle, follow the seed of the earth and its people.

Nothing adds more zest to the length of days than a lively interest in affairs outside our own. Hindu literature gives us a beautiful story of a Master who sent the inconsolable mother of a lovely child (whose spark of life had been suddenly extinguished by the poisoned fangs of a snake) to beg from her neighbors, a few grains of common seed, but she must only, he told her, accept the gift from a house in which there had been no death. After many days she returned to the Master, crying, "Alas! I have found no home through the portal of whose porch the Angel of Death hath not entered." Then said the Master, "Little sister, learn this lesson, your grief is so common the whole world weeps with you."

As the years roll away from us, let us cultivate in the hush of our eventide silences, a closer communion with our souls, and our responsibilities to our fellow-beings—while we still have time and mundane opportunity to help in the prevention of the appalling waste of life (from preventable causes) among the rising tide of humanity, those still in their childhood. Let us strike the words "too late" from our

vocabulary. The time will come soon enough, for most of us, when we shall have to realize, that whether it be this world's possessions, or the remembrance of well doing, "all we can hold in our cold, dead hands, is what we have given away." The kindly deeds, the spoken words, have a longevity all their own.

It is within the power of every one to leave their own little niche in this world better than they found it, and to preserve a serenity in old age for themselves, by keeping the heart youthful in its emotions, a personality radiant with *sincerity of purpose*, and a sympathy for which the whole world hungers.

"Life's more than breath and the quick
round of blood;

'Tis a great spirit and a busy heart.

We live in deeds, not years; in thoughts, not
breaths;

In feelings, not in figures on a dial.

We should count time by heart-throbs. He
most lives

Who thinks most, feels the noblest, acts the
best."

—Schiller.



HOMER

Whose Iliad, though written 1000 years B. C., is still without
a peer in the realm of epic literature





HOW TO ENERGIZE THE CIRCULATION AND FLATTEN SHOULDER
BLADES

Control breath, slowly extend arms, holding them tense until a warmth is felt in palms or tips of fingers.

INTRODUCTION TO EXERCISES

DR. ALBERT J. ATKINS, president San Francisco and County Society of Physicians and Surgeons, says: "Dr. Emily Noble's lectures on health are of practical value to all who have the privilege of hearing her. . . . They deal with the life principle itself. . . . Her 'Method for the Millions' should be in every one's hands."

Practical work along the lines of correct deep breathing soon convinces the most skeptical that it is the only method that polarizes the "electro-chemic" action of all bodily functions.

In this system we must call our students' attention to the three great points of difference between this and other systems taught in the West:

First—This method must be diaphragmatic as well as thoracic, in order that the constant rhythm may move and energize the internal organs, unconsciously, with every breath.

Second—A conscious development of dynamic energy, which can, through nerve

energizing, be diverted to any organ or tissue of the body and held there long enough to start up a revitalizing process.

Third—No *muscular effort* is used in the exercises, the rhythmic effect of correct breathing being controlled while the nervous system is tensed or energized.

A curious fact existing in connection with deep breathing is that much more air can be inspired through the left nostril than the right one. Naturally, every one will doubt this, but the fact can be verified by any one at any moment, if they will take the recumbent position, and first, note where the breath responds, when breathing through both nostrils; then try shutting off the right nostril, then the left, and it will be found there is quite a difference in control of respiratory muscles. Students must learn, at any early part of the lessons to control the rhythm long enough to establish an interval of from ten to fifty seconds between one breath and another. That generates a vital force which controls the nerves and prolongs life. High-strung nerves can always be quieted by taking the recumbent position, on the floor or any unyielding surface, and holding a few

deep breaths, with the abdominal and costal muscles expanded.

This exercise alone generates vitality and control of nerves in a manner that no other method can accomplish, and is the first step toward the full consciousness of health and mental and physical balance. The nervous system radiates its energies like the sun. The solar plexus is the sun center; the blood supplies the nervous system, and is its shadow; together, they form positive and negative poles, and are the highest vibration of electrical energy in this sphere—*i.e.*, human life.

Students must not lose sight of the fact that there are only three sources of life—food, water and air—and that food elements get their vitality in the blood from inspired air.

Students must be careful not to attempt contouring, poise exercises and nerve energizing until they have thoroughly mastered the rhythm of the abdominal walls, which must expand unconsciously with every breath. In all positions, either lying down, sitting, standing, walking, sleeping or waking, with careful attention to these lessons, any one can so re-establish that diaphragm-

atic rhythm which every one is really born with that he will never lose it again. In from one to three weeks the habit will be so formed that this rhythm, or *law of expansion and contraction*, which puts one in vital touch with the universe, and which vibrates every internal organ with every breath and regulates their blood supply, also their functions of excretion and secretion, will take care of itself, and the old method of chest expansion only would be fatiguing by comparison.

In acquiring the deep breath the left nostril is used, because it is on the negative side of the body, and *because it quickly overcomes the habit of high-chest breathing*.

Exercise 1. To purify the system, inspire slowly through the left nostril while in the recumbent position, taking care that the abdominal muscles expand while inspiring; hold both nostrils shut as long as comfortable, then slowly expire through both nostrils; repeat several times, near an open window. Many diseases that are caused by imperfect oxygenation of the blood are cured by this exercise alone. It is well to take this exercise in walking also, and after the dia-

phragm rhythm becomes natural, in any position.

Exercise 2. Students must note the fact that it is impossible to learn the costal and diaphragm rhythm at the first few efforts, excepting in the recumbent position; then it becomes natural in any position. No *muscular or violent physical culture exercises are permitted with any of these lessons*. All must be done calmly and quietly, and by *breath control alone*—energizing the nerves, by tensing them in any part of the body, just as long as the breath can be *comfortably* held without muscular effort. In this method Nature takes care of the chest, and by costal and abdominal expansion with each inspiration, the lungs gain more elasticity and expansion and entirely lose the sense of constriction that is felt with chest expansion only. Every purchaser of this book to whom this or other exercises may not be quite clear is entitled to a free letter of explanation from the publisher. Practiced twice a day, and for about ten minutes, on rising and retiring, this method will keep any one in perfect health, if done correctly. *None of these lessons are occult, obscure or difficult, a*

knowledge of which we wish to diffuse among the millions all over the world who are scattering instead of conserving their life forces. If, for a moment, any of the exercises causes a feeling of dizziness, that merely indicates that the circulation is quickened and the brain getting a better blood supply. It only lasts a moment and is beneficial.

Exercise 3. When the costal and abdominal rhythm is thoroughly mastered in the recumbent position, then practice it sitting and standing and walking.

Exercise 4. The standing posture in deep breathing is easily learned if the student stands with the abdomen against a door or wall, which enables him to feel resistance. This is usually difficult at first, but with a little practice is soon overcome, and the tendency to inflate the chest only will be broken. Also lie upon the floor, face downward.

Exercise 5. In all positions of sitting, standing and walking carry the chest up and forward, placing the ball of the foot first on the ground in walking, instead of the heel. When the chest is allowed to slump downward, in sitting or standing, it crowds



A STRETCHING EXERCISE.

Of value on awakening from sleep, and especially useful to invalids, who can by this method arouse the circulation.



CONTROLLING RHYTHMIC BREATH, TO QUIET NERVES

This illustrates also right position for learning rhythmic breathing, after which deep breathing becomes automatic in any position.



RIGHT WAY TO STAND AND WALK

Chest up and forward. Mental impulse of starting to walk. This flattens abdomen, strengthens torso and spinal column without conscious effort; control breath.



ENERGIZING THE WHOLE BODY THROUGH BREATH CONTROL
WITHOUT MUSCULAR EFFORT



all the internal organs out of proper position. After the student has thoroughly learned to hold the deep breath with expansion of all chest diameters, any of the following exercises will help to generate "a sound mind in a sound body" by arousing vital energy and diverting it, through conscious nerve tensing or energizing, to any part of the body, always remembering, that the deep breathing interval, held with expansion instead of contraction, is the keynote to success.

Exercise 6. Control the breath, tense the hands and arms, and raise them slowly outward and upward, gently swaying the body forward and backward, and from side to side, taking a new breath with each movement, always keeping the weight of the body on the balls of the feet. This radiates energy to every part of the body, deepens the voice, and strengthens the vocal register.

Exercise 7. To reduce superfluous flesh, tense the whole body, kneel on the floor, and lay forehead on the ground without touching the floor with hands or arms; then slowly sway backward as far as possible, taking a fresh breath with each movement.

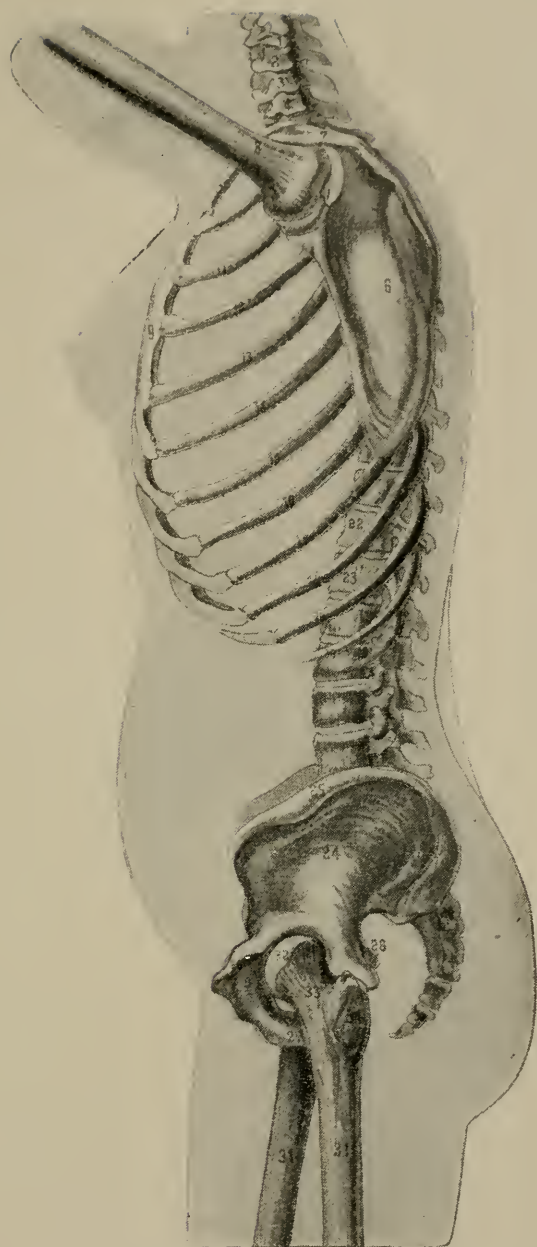
Exercise 8. To reduce abdomen and re-

store contour of waist and loins, lie flat on the floor, face downwards, and slowly rise on hands and toes while holding the breath, and gently lower and raise the body from the floor; repeat slowly many times—one movement with each breath. Also, roll on floor.

Exercise 9. A stretching and reaching movement to restore suppleness of contour: Tense the whole body; control the breath; poise on the balls of the feet alternately, slowly swinging the body, pointing upward and downward in every possible position and curve.

Exercise 10. Especially good for poor circulation, building up the throat and chest, and improving depth of voice: Stoop for imaginary weights and, with tensed muscles, throw them in every direction. Pick up imaginary heavy weights and, with tensed muscles, raise arms up in front, over top of head, bending and stretching from front to back slowly.

Exercise 11. Stand in the open doorway, expand abdomen, hold the breath, grasp the door posts as high as possible; this will raise and support the internal organs. Tense the



Note the marvelous provision of Nature in the attachment of the ribs to the breast-bone, each with its own little strip of cartilage, to admit of expansion when lungs inflate. Note also how easily the lower ribs may be permanently injured in the young girl by tight-lacing.



Control breath, raise knee, bend over and touch it with chin. Excellent for reducing thick waist lines.



Stoop, keeping back straight from hips to neck, sway from side. Splendid in both sexes for strengthening small of back.



lower limbs alternately backward and forward, toes pointed downward, knees stiff; one movement for each breath, controlled as long as comfortable. This is especially good for pelvic organs. Also energize whole body by balancing on alternate feet.

Exercise 12. Especially good for energizing nerve centers, liver and spleen, and to divert nerve energy to any organ or tissue of the body, head, face or throat: Press firmly, with flat hands, any part of the body, breathe deeply, expand, and consciously divert the energy created by the breath to any selected spot. This same energy can be diverted to the throat and vocal chords.

Exercises 13, 14. Especially good for clearing air passages and preventing colds: Stand by open window (especially on arising in the morning), close alternately each nostril with finger and gently inhale up one, then close it, while exhaling gently down the other; then inhale and exhale *alternately* up one and down the other, making it a head or nasal breath as much as possible. Then take a long breath, exhale it *very slowly*, but forcibly through a pipe-stem; this energizes the air passages of the nose

and throat, and prevents deafness and catarrh. Puff cheeks as in blowing exercise. To strengthen the throat and the vocal chords, divert the breath to the muscles at the base of the throat, hold it there by placing the tongue at the back of the upper front teeth, where it would be if sounding a word ending with *th*, such as *south*. Alternately yawn and swallow, which raises and lowers the glottis to its highest and lowest limits; sing the sounds *oo-haw* outside the lips in one breath. See chapter on Voice Building.

Many other simple exercises will evolve in the student's mind. All we ask is, that no ordinary *physical culture or violent muscle movements* be made. Let the *rhythmic breath* be *the keynote*, and write to the publisher if further explanation be needed. In all these exercises use *expansion, contraction* and *resistance*.

For those who do not yet realize what diverting conscious energy to any part of the body means, they can understand it readily if they will lie down, take the rhythmic breath, and *control it*, while another person tries to raise an arm or a limb, the student

resisting *mentally* the effort of the other person as long as the breath can be comfortably controlled.

Efforts of this nature are particularly useful to invalids and persons of advanced years. Resistance exercises are the basis of much of the treatment at foreign watering places, and would be doubly efficacious if combined with lessons in rhythmic breathing and controlled breath. In the health culture exercises outlined in this book the reader must bear in mind that *correct breathing involves the function of smelling*.

First, and always, every morning on arising from slumber, go to an open window and energize the nasal chambers and air passages by alternate nostril breathing (see Exercises 13, 14), and by a close adherence to the basic principles laid down in this lesson-book, renewed vitality and the power to consciously energize or relax every nerve and muscle will be the reward of the student.

For further instructions, write publisher,

RICHARD B. NOBLE

HUNTINGTON CHAMBERS, BOSTON, MASS.

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November, 1906.

*Internationally Recognized as One of the Most Important Educational
Movements of the 20th Century, one that will leave its imprint
on coming generations.*

FOUNDER AND ASSISTANT SUPERIN- TENDENTS

EMILY NOBLE (returned from India), New
York City and Boston, Mass., Founder
and Superintendent.

MISS ALYS E. BENTLEY, Director of Music
in Public Schools, Washington, D. C.,
Center.

MISS E. C. WESTCOTT, Principal Western
High School, Washington, D. C.,
Center.

R. B. NOBLE, Publisher, Boston, Mass.
(Huntington Chambers.)

Treasurer, WILLIAM J. KEELEY, Esq., New
York City.

Secretary, Mrs. W. J. KEELEY, The Ply-
mouth, West 149th Street.

Among the Board of Directors and those

who endorse this movement can be found the names of some of the most prominent men and women of the day, including Presidents of Medical Societies, Army Generals, Senators, Ministers, Bankers, Editors and Educators.

At a meeting held March 27, 1907, by the promoters and organizers of the above-named crusade, it was unanimously

Resolved, That the above-mentioned crusade be, on said date, duly organized and chartered upon the basis of the annexed programme.

Whereas, The founder and co-workers of the above-mentioned crusade, having matured the plans and work of the past three years into successful realization and public recognition, now *Resolve* to extend and propagate the activity of the crusade as an educational branch of the physical development of children.

OBJECT OF THE CRUSADE

To establish centers in all large cities, where *parents* and *teachers* may obtain free scientific instruction and practical suggestions for the prevention of nasal and pulmonary troubles in children.

During her recent visit to Washington, D. C., to lecture (by the invitation of the Board of Education of the District of Co-

lumbia, Washington, D. C.), the founder personally invited the fullest investigation of this Crusade of the Surgeons-General of the Army, Navy and Marine Hospital Service. And the Board of Directors of this Crusade and organization cordially invite the investigation and co-operation of all State and Municipal Boards of Health and Education.

The founder of this Crusade continues to accept invitations from Medical and School Boards, Mothers' Congresses, Musical Societies, etc., to give lecture demonstrations on rhythmic breathing and what its correct development means for the human body. Her "Method for the Millions" who only half breathe is the key to practical *daily* physical regeneration from the cradle to the century mark. Ella Wheeler Wilcox says of it: ". . . of more value to the health of the growing race than all the scientific books written by all the physicians of the world."

"I am simply amazed at the benefit I have received from the lessons in deep breathing. This is the greatest thing that has come into my life as a regenerating force. I wish it might be taught to all children. I am firmly of the belief that it would eliminate the catarrhal and pulmonary troubles characteristic of this climate."—E. C. WESTCOTT, Principal, Western High School, Washington, D. C.

Madras Times, India, July 20, 1901.—“Dr. Emily Noble has come to India at the invitation of some of our most prominent native gentlemen, to investigate Light and Electro-Therapeutics in their action on diseases peculiar to India. The lectures of this gifted woman-physician and lecturer, are looked forward to with keen interest. She has come to us with highest credentials, both medical and social, and to substitute Dr. E. D. Babitt of California.”

Associated Press.—“Since her return from the Orient, Emily Noble has exchanged the medical for the lecture field, and has no rival in her travel talks of life in other lands. She has an international reputation as a writer on health and travel, and has had the unique distinction of raising the American flag with full military honors. She is a popular speaker on the lecture platform, a member of the Pacific Coast Press Association, the Medico-Legal Society of New York, the Women’s Health Protective Association of New York, the American International Congress on Tuberculosis, the English Order of St. John of Jerusalem, the Red Cross Society of the United States of America and other societies of note.”

Associated Press, New York, November 15, 1906.—“Among the best of the many excellent addresses before the American In-

ternational Congress on Tuberculosis, meeting in joint session with the New York Medico-Legal Society, was one on 'Practical Methods for the Prevention of Tuberculosis in Children,' by Dr. Emily Noble of California."

Much of the work of the founder of this Crusade is free.

During the past two years more than ten thousand mothers, and teachers, and children have been instructed. All are urged to join an *endless chain of Crusaders* and unite in gaining knowledge that will stamp out the greatest menace to the lives of children the world has ever known. *Knowledge is power. Begin now.*

"So are they blessing Emily Noble for her crusade work against consumption, and so should Dr. Whitehead be blessed for her strong words regarding the ignorance of public school teachers and mothers on this important subject.

"Mothers and teachers! Why, were they properly educated in these simple truths, and properly awakened to their influence, what a world ours would be!

"I would like to see some one community put into the hands of four persons for the next fifteen years and the results carefully watched. These persons would be Luther Burbank, author of 'Training of the Hu-

man Plant'; Emily Noble, Eugene Christian and Dr. Whitehead. . . .

"I am very sure that were this done the community would receive the blue ribbon of the whole world at the end of fifteen years for vigorous, healthy, happy and moral people."—ELLA WHEELER WILCOX (Syndicate), May 14, 1908.

EMILY NOBLE,
Murray Hill Hotel,
New York City.

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INDEX

A

ARDOMEN, obtrusive, 58.
 Abernethy, Dr., 117.
 Acids, 44, 61.
 Acorn, 58.
 Adipose, superfluous, 52.
 Air, 12.
 Air, filtering the, 3.
 Air-cells, 8.
 Air-sacs, 8.
 Alcohol, abstinence from, 32.
 American food products, 47.
 Anesthesia, 7.
 Animal food, abstinence from, 32.
 Arterial blood, 7.
 Arterial degeneration, 32.
 Asepsis, 7.
 Atkins, Dr. Albert J., 121.
 Auto-massage, 104.

B

BACTERIA, 23, 33.
 Baines, A. E., 43.
 Banting cure, 60.
 Beans, 43.
 Beethoven, 85.
 Bentley, Alys E., 73.
 Biceps, bulgy, 92.
 Bleyer, Dr., 80.
 Blood, circulation of, 34.
 Blood stream, 12, 31.
 Blowing exercises, 96.
 Body building, 15.
 Body building, cellular process of, 29.
 Body, drainage of, 35.
 Body, reconstruction of, 31.
 Brain workers, 15.
 Bread, gluten, 54.
 Breath, 12, 14.

Breath, control of the, 15, 68.
 Breath exercise, a, 97.
 Breath, exhalation of the, 57.
 Breathing capacity, natural, 14.
 Breathing, cessation of, 1.
 Breathing, correct, 21, 35.
 Breathing, costal, 65.
 Breathing, defective, 11.
 Breathing, function of, 13.
 Breathing gymnastics, 60.
 Breathing, high chest, 65, 124.
 Breathing muscles, 62.
 Breathing, normal, 9, 65.
 Breathing, normal, a lost art, 67.
 Breathing, rhythm in, 33.
 Breathing, value of deep, 25.
 Breathing, Yogi system of, 18.
 Buttermilk, 32.

C

CAMPBELL, Dr. Lloyd M., 42.
 Capillaries, 8.
 Carbon, 54.
 Cellular process of body building, 29.
 Cellular tissue, reconstruction of, 45.
 Chemical structures, 2.
 Chest, additional measurement of the, 66.
 Chest, overdeveloped, 92.
 Chittenden, Professor Russell H., 38.
 Chladni, 76.
 Circulation of the blood, 34.
 Circulatory system, 15.
 Clergymen's throat, 69.
 Cocoa, 43.
 Coffee, 43, 61.
 "Cohibitio spiritus," 68.

Colds, ordinary, 25.
 Concentration and relaxation,
 105.
 Constipation, 52.
 Consumptive, chances of, for
 complete recovery, 24.
 Constrictors, 3.
 Contour culture, 99.
 Contouring, 123.
 Contraction, rhythmic law of,
 33.
 Corpuscles, 32.
 Corpulence, 53.
 Corpuscles, function of the, 32.
 Creative forces, 31.

D

DALLAS, 68.
 Dancing, 94.
 Deficient supply of food, 30.
 Degeneracy, mental and moral,
 45.
 Depew, Senator Chauncey, 116.
 Destructive forces, 31.
 Dead vegetable matter, 34.
 Decaying vegetable matter, 34.
 Dextrins, 41.
 Diaphragm, 65.
 Diet, 44.
 Diet, mixed, 54.
 Diet, simplicity of, 46.
 Dietary, reducing, 61.
 Dietetics, simplified, 37.
 Dieting for putting on flesh, 60.
 Digestion, disturbed, 44.
 Dilators, 3.
 Dionysius, 59.
 Disease, prevention of, 33.
 Disease, resistance to, 13.

E

EATING, æsthetics of, 40.
 Edison, Thomas A., 80.
 El Cornaro, 114.
 Electro-chemic energy, 24.

Electro-chemic processes, 23.
 Elephant, the, 35.
 Emotions, 58.
 Energy, well-directed, 29.
 Exercise 1, 124.
 Exercise 2, 125.
 Exercise 3, 126.
 Exercise 4, 126.
 Exercise 5, 126.
 Exercise 6, 127.
 Exercise 7, 127.
 Exercise 8, 127.
 Exercise 9, 128.
 Exercise 10, 128.
 Exercise 11, 128.
 Exercise 12, 129.
 Exercise 13, 129.
 Exercise 14, 129.
 Exhalation, 11.
 Exercise for reducing waist line,
 100, 103.
 Exercises for strengthening the
 muscles of the eyes, 97.
 Exercises, introduction to, 121.
 Exercises, respiratory, 35.
 Exhaustion, nervous, 15.
 Expansion and contraction, law
 of, 92, 123.
 Expansion, rhythmic law of, 33.

F

FARADAY, 77.
 Far East, people of the, 35.
 Fat, 55.
 Fat people, 58.
 Filtering the air, 3.
 Fisher, Professor Irving, 39.
 Fission, 33.
 Fletcherism, 42.
 Food, 12, 43, 56.
 Food, appearance, odor, and
 palatability of, 40.
 Food, insufficient, 45.
 Food, superfluous, 32.
 Foods, highly seasoned, 58.
 Foods, starchy, 60.

Foods, white, 61.
Fruits, 43.
Fungi, 33.

G

GALEN, 59.
Galileo, 76.
Geometric scale, a, 76.
Goldsmith, 110.
Grain, 43.
Growing old, 55.
Gymnastic appliances, 94.

H

HAIG, Dr. Alexander, 43.
Heart, 57.
Heart disease, 101.
Hemholtz, 75.
Henderson, C. Hanford, 74.
Higgins, Dr. Hubert, 42.
Hindu literature, 75.
Hindu story, 119.
Hippocrates, 52, 59.
Human being, 58.
Human body, upbuilding of
the, 23.
Human glands, juices of, 23.

I

INFECTION, germ theory of, 13.
Inhalation, 11.

J

JAPANESE, 92.

K

KING SOLOMON, 74.

L

LIFE, key to, 13.
Life, sources of, 21.
Light wines, 61.
Longevity, first aid to, 118.
Lung capacity, overtaxing, 14.

Lung development, insufficient,
12.
Lung trouble, predisposition
to, 25.
Lung trouble, signs of early
stages of, 25.
Lungs, 8, 17.
Lymphatic temperament, 53.
Lymphatics, 34.

M

MAHABHARATTA, the, 84.
Mal-nutrition, 102.
Marga Sangita, 84.
Mastication, thorough, 40.
Metchnikoff, 114.
Milk, 60.
Mixed diet, 54.
Mouth, 13.
Mouth breathing children, 92.
Muscles, throat, 69.
Music, origin of, 81.

N

NASAL fossæ, 4.
Nasal hygiene, 7.
Nasal tendencies, prevention of,
12.
Nerve energizing, 123.
Nerves, control of the, 15.
Nervous system, 15.
Nervous system, certain func-
tions of the, 56.
Nitrogenous foods, 53.
Nose, 3.
Nose, functions of the, 3.
Nostrils, 13.
Nutrition, 45.
Nutrition, cellular, 23.
Nutrition, debilitated, 24.
Nutrition, proper, 45.
Nuts, 43.

O

Obesity, dieting for, 60.
Obtrusive abdomen, 58.

Old age, germ of, 32.
 Old age, postponement of, 33.
 Old age, problem of, 22.
 Olfactory bulb, 4, 6.
 Olfactory nerve bulb, 10.
 Olfactory nerve bulb, terminals of the, 4.
 Olfactory nerve influence, 2, 11, 66.
 Olfactory mucous membrane, 4.
 Olfactory region, 4.
 Ordinary colds, 25.
 Orientals, the, 112.
 Osler, Dr., 7.
 Outdoor life, lack of sufficient, 31.
 Overeating, 54.
 Overwork, 30.
 Oxygen, 8.
 Oxygen, atmospheric, 7.
 Oxygen, lack of, 55.
 Oxygenization, 11.

P

PASTRY, 61.
 Personal hygiene, value of, 25.
 Phagocytes, 23.
 Physical culture, 14.
 Physical efforts, 54.
 Physical endurance, overtaking, 15.
 Physical regeneration, key to, 13.
 Physical strength, rapid increase in, 66.
 Plato, 68.
 Poise exercises, 123.
 Pores, congestion of, 34.
 Poverty, 45.
 Proteids, 39.
 Public speakers, 69.
 Puddings, 61.
 Pulmonary tendencies, prevention of, 12.
 Putting on flesh, dieting for, 60.
 Pythagoras, 47.

R

RAMAYANA, the, 84.
 Reconstruction of cellular tissue, 45.
 Reconstruction of the body, 31.
 Recumbent position, 122.
 Red corpuscles, 32.
 Reducing dietary, 61.
 Resonators, 4.
 Respiration, 11.
 Respiration, chemical theory of, 8.
 Respiration, muscles of, 3.
 Respiratory exercises, 21.
 Respiratory tract, 3.
 Rhythm, 92.
 Rhythm, normal, 10, 93.
 Rhythm and controlled breath, 88.
 Rhythmic breath, 14, 17.
 Rhythmic breath, how to re-establish, 22.
 Rhythmic breathing, 2, 13, 69, 100.
 Rhythmic law of contraction, 33.
 Rig Veda, 82.
 Rishas, 82.

S

SAGE, Mrs. Russell, 115.
 Salads, 54.
 Saliva, 23, 40.
 Sanguine-bilious temperament, 53.
 Sanitation, 7.
 Saraswati, 81.
 Self-control, 29.
 Simple living, science of, 41.
 Simplicity of diet, 46.
 Simplified dietetics, 37.
 Sita, 86.
 Sound cavities, 4.
 Sounds, 63.
 Sour milk, 32.
 Speaking voice, improving the, 72.
 Starch, 41.

Stomach, impaired function of
the, 30.
Stout people, 53.
Sub-acid fruits, 61.
Sugar, 60.
Sun, electrical energy bound up
in the, 36.
Superfluous adipose, 52.
Swallowing, 56.
Sweets, 60.
System of irrigation, 30.

T

TEA, 43, 61.
Thoughts, 58.
Tissues, 34.
Tone placing, 4, 71.
Tone placing, wrong, 72.
Torso, muscles of the, 95.
Tubercle bacilli, 24.
Tuberculosis, germ of, 24.
Tuberculosis, prevention of, 20.
Turkish bath, 60.
Tyndall, 75.

U

UNCOOKED food, abstinence from,
32.
Universal energy, 2, 56.

Upanishads, 68.
Uric acid, 43.

V

VEGETABLES, 43.
Vegetables, green, 54.
Venous blood, 7.
Vibrissæ, 3.
Vital energy, renewal of, 45,
102.
Vocal chords, 71.
Vocal sounds, quality of, 71.
Voice building, 4.
Voice building, rightly placed, 62.

W

WAGNER, 85.
Water, 12, 45, 46, 61.
Water, hot, 54.
Well-directed energy, 29.
Wheatstone, Professor, 78.
White corpuscles, 32.
Wilson, Dr. James, 46.

Y

YOGI, 19.
Yogi breath, 19.



STUDENTS' NOTES



QP121

N66

[Noble]

